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PAPER TRADE JOURNAL

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Vol. LXXXIV, No. 8 FEBRUARY 24, 1927 Per annum, $4.00 This issue, $1.00

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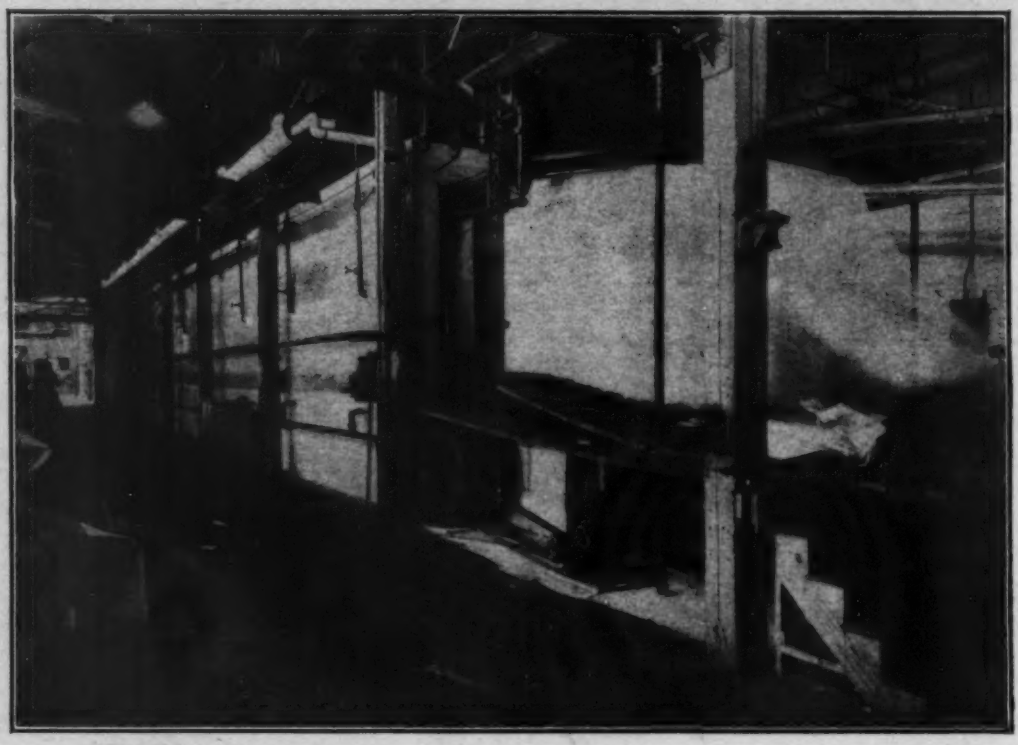

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PAPER TRADE JOURNAL

ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

FIFTY-FIFTH YEAR

Published Every Thursday by the

LOCKWOOD TRADE JOURNAL CO., Inc.

LESLIE R. PALMER, President — GEO. S. MACDONALD, Vice-President & Treas. — F. K. HOPPIE, Secretary

Executive and Editorial Offices: 10 East 39th Street, New York
Chicago Office: Room 14, Suite 410, 123 West Madison St.

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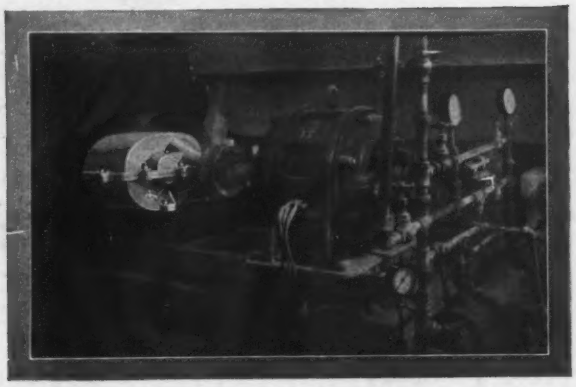

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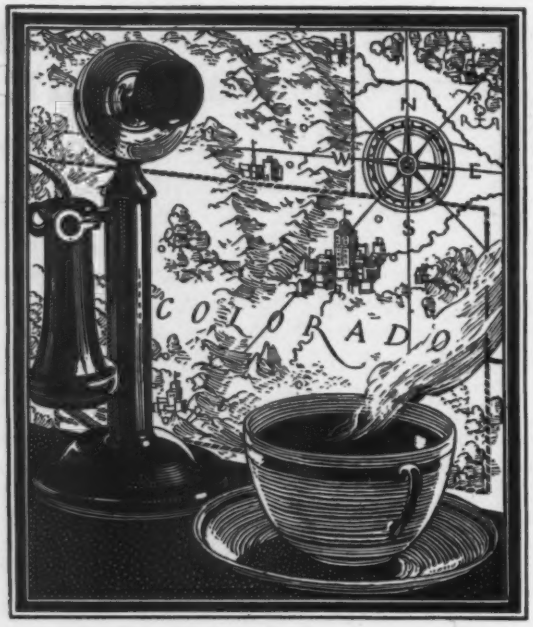

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PAPER TRADE JOURNAL

With Which Is Combined

PAPER

Vol. LXXXIV, No. 8 — Thursday, February 24, 1927

The Magazine of the Paper Industry

Paper Industry Experiences Satisfactory Year

Production and Volume of Business Transacted Greater Than in Preceding Twelve Months—Prices Ruled Fairly Steady and Profits are Reported to Have Been Slightly Better, Due to More Efficient Management and Economy of Production—Exports Reach Highest Figure Attained Since 1921—Prospects For Current Year Bright

Written Especially for the Annual Number of the Paper Trade Journal by H. J. Laughton

In many respects the paper industry is entitled to look back with satisfaction on the conditions which prevailed during 1926. Compared with the preceding twelve months a distinct advance was recorded. The monthly average production showed an increase of 9.9 per cent over 1925, according to the Department of Commerce, and while prices were fairly steady, it is reported that profits have been slightly better, due in the main to more efficient management and greater economy of production exercised by the paper mills.

Exports of paper and paper products from the United States during 1926 reached a total value of $26,828,674, the highest figure attained since 1921, which totalled about $29,000,000. Compared with 1925, these exports increased 12 per cent in value, and probably a higher percentage in volume, as the average values of more than half the various classes show a decline.

Almost all items in the paper schedule contributed to the rise in value of the total exports, the heaviest gains being registered in shipments of boards, writing papers, and surface-coated papers. In addition to paper, boards, and manufactures, $4,963,508 worth of paper base stocks were shipped from the United States to foreign countries during 1926.

Financial Situation Strong

The financial structure of the Federal Government is in excellent shape. Andrew W. Mellon, Secretary of the Treasury, reports that the national debt is below $19,500,000,000, as compared with a peak of $26,500,000,000 just after the war; Government bonds are all above par and taxes are yielding ample revenue. Government expenditures have been kept down and the work of the Federal Government is more efficiently handled.

Credit throughout the country seems to be ample. An indication of this is the ease with which $16,000,000 has recently been raised through private subscription for marketing corporations to handle the situation arising out of the large cotton crop. Money for investment is plentiful, and it is most encouraging to note the extent of security investments represented by the small investor. On the whole, our domestic situation is in good shape, and we can look forward to another satisfactory year.

The increase in installment-plan buying has caused much discussion. Within limits there is nothing inherently unsound in this practice. One of the results of the extension of installment purchases has been to increase the immediate consumptive power of the public and thus permit large production and full employment to continue.

The increased savings deposits, in building and loan associations, in life insurance, and in investments, shows that the installment buying has not yet progressed to a point where it interfers with the intelligent saving of the American people.

Outlook for Current Year Promising

Opportunities for success in the United States are greater than ever, in the opinion of Elbert H. Gary, chairman of the United States Steel Company. Any well posted man will say that general business during the year 1926 has been extraordinarily good. "We are rich in resources, including cash balances in the bank," says Judge Gary.

"Our banking facilities have been improving year by year ever since the Federal Reserve was established. This is likely to continue. The labor conditions are unusually good. There is very little disagreement or dissatisfaction to be found in industrial circles.

"As to the future, no one can be certain as to what is going to happen. Many things may occur to change the business situation for the worse at any time. Some of them may be preventable, but with the opportunities, as outlined, there is no reason why prosperity during 1927 will be seriously interrupted.

"There is nothing in sight to indicate that it will be. If business shall be seriously diminished during the coming year, it will be the fault of ourselves, and not the fault of natural conditions or the ack of consideration and fair treatment by the national administration."

News Print Output Continues to Expand

The feature of the news print industry during the year 1926 was the fact that the worlds leadership in production passed to Canada. The United States continues to be by far the greatest user of this product. Out of a total North American production of 3,768,000 tons, Canada furnished 1,882,000 tons, an increase of 24 per cent over 1925 and surpassing by 195,000 tons the output in the United States.

However, the production of the United States mills was 1,687,000 tons, and greater by 156,000 tons, or 10 per cent than the previous high record of 1925. There was a gain of 93 per cent in Newfoundland, as new operations got into full swing in that country and brought the total up to 186,000 tons.

The actual consumption of news print in the United States was around 3,400,000 tons, or at the rate of 58 pounds per capita, compared with 52 pounds in 1925. This enormous use of news print was the climax of steadily increasing sizes and circulations of daily and Sunday newspaper, and increased volume of advertising.

Additions to the news print manufacturing industry in North America totaled 64 machines with a rated capacity of 4,800 tons, from the beginning of 1919 to the end of 1926. Of these machines, 48 were installed in Canada, 11 in the United States, and 5 in Newfoundland. With installations now nearing completion, the North American news print machines, by the middle of the present year, will have a daily capacity of 15,000 tons.

Fine Paper Conditions Practically Unchanged

Fine paper market conditions, comprising writing, cover and tissue papers in their various grades, were practically the same during the past year as in 1925. The volume of business transacted in the writing and cover paper markets was one of the best in the history of the industry, and the writing mills, in particular never made or shipped more newspaper, or reported heavier sales, at any previous time.

In their quotations, however, the mills absorbed high costs, and profits for the year were only fairly satisfactory. Prices in the tissue paper market fluctuated all through the early months of the year, and did not begin to stabilize until the autumn. This stabilization was the result of the insistence in individual cases, of receiving quotations which might be accepted from a mill as indicative of its quotations for at least a month or two.

Production of writing paper during 1926 followed orders rather closely. Sales for 1926 were 4 per cent higher in dollars and 6 per cent higher in tons than in 1925. Sales of cover paper for 1926 were 5 per cent higher in dollars and 4 per cent higher in tons than in 1925.

Approximately 28 new machines, with a daily capacity of 1,238 tons, were installed in the United States during 1926, representing an increased capacity for the industry of around 384,000 tons a year. When the addition to capacity by improvements and additions to existing equipment is considered, it is believed that the increased capacity last year was close to the increase in output.

Book Paper Consumption Excellent in 1926

Manufacturers of book paper operated at around 95 per cent during 1926, and the output was apparently just slightly ahead of consumption. Consumers of this grade of paper are principally magazines and periodicals, the publishers of which experienced large advertising patronage and expanding circulations, in most instances.

With few exceptions, prices remained firm during most of the year. Due to increased production, however, brought about by installation of new machines, the tendency in renewing contracts was for lower prices, which approximately averaged $2 to $3 below the schedule of the preceding year.

Estimated production for 1926 was around 1,500,000 tons, which closely approximated consumption in that period. This consumption is looked upon as being highly satisfactory, although the output could have been increased somewhat had the demand warranted it.

Several new machines are to be installed in the current year, and the estimated increased production for 1927 will be in the neighborhood of 5 per cent over the capacity for 1926. All signs indicate that consumption will keep pace with the estimated increased output.

Coarse Paper Industry Prospering

Taking everything into consideration, the coarse paper industry experienced an excellent year. One of the principal factors that led to this result was the reduction of the margin between production and consumption. It is a pleasing fact that the market absorbed the additional product of the quite respectable number of new machines that were installed during the year, with ease.

The largest part of the growth in the wrapping paper industry was absorbed by the kraft mills, and the expansion of the kraft paper industry in recent years has been really marvellous. Sulphite and groundwood papers were also in great demand. With a large number of merchants, light weight machine glazed sulphite papers are becoming very popular, because they can be dyed in fine pastel shades.

Many new mills are springing up in the South, where cheap raw material, labor, and power can be found. The past year has demonstrated that the South is destined to play a leading role in the coarse paper industry, and plenty of room remains for existing organizations to expand their capacity. The Pacific Coast, is awakening to its oportunities, and, through its enormous lumber industries, offers numerous advantages to the enterprising paper maker.

Incidentally, towards the end of last year, the wrapping paper industry published a set of Trade Customs, filling a long felt need contributing toward the proper conduct of business. Manufacturers have generally adopted these Trade Customs, with very few exceptions, and they have also met a good reception from the jobbers and consumers.

Paper Board Prices Decline

While the production of paper board last year was exceptionally large, price levels declined, and the results were rather disappointing. While many economies were made, mainly due to the constructive work of the Paper Board Industries Association, such low prices were made by the members of the industry that all the economies gained were passed over to their customers.

Seasonal demand differences bring many problems to plant management in adjusting facilities between excessive demand and slack or idle periods. A number of cost accounting systems were installed in many paper board plants during the past year, and with the expansion of this modern accounting, it is believed that the price situation will right itself before very long.

The outlook for the current year is considered promising. The year opened with a more stabilized price level for box board, and an average box price more nearly in keeping with good merchandising. It is pleasing to note that during 1927 effort is to be made by the box makers to assist the mills in overcoming the sharp changes in demand for board, and consequent irregularity in running time and output. This will undoubtedly have a beneficial effect on the situation.

Wood Pulp Industry Becomes Normal

The condition of the wood pulp industry at the end of 1926 was practically normal again. At the beginning of the year, the market opened well, and brisk buying prevailed during the first three months. The demand decreased somewhat in the second quarter of the year, especially in the spot market, and for summer deliveries.

Canada led in the exportation of wood pulp to the United States by shipping approximately 518,000 tons of chemical wood pulp, with Sweden a close second, with about 500,000 tons, followed by Norway and Finland. The combined output exceeded the production in 1925, and in the case of Sweden alone by approximately 140,000 tons.

Norway would probably have established a new production record, but for labor troubles and difficulties in the appreciation of her currency. Until the closing of the Norwegian mills the production had been very satisfactory. The decreased production in Norway probably stimulated the world's market, which had shown signs of declining since April.

While there was a gradual weakening of quotations during the summer months and until the end of the year, it is gratifying to note that the decrease in the average price during that period did not exceed 5 per cent, bleached sulphite and ground wood being the weakest.

In the development of Alpha pulp, another satisfactory substitute for some grades of rag stock appears to have been found. The artificial silk industry is also strengthening the position of

wood pulp, and there is no doubt that this industry will require a larger amount of the product in the future. Many other kindred industries are also using wood pulp indirectly.

Paper Stock Business Fluctuated During 1926

Although the volume of business transacted in the paper stock market during the past year was large, competition was so keen, that the margin of profit was adversely affected. Purchasing by the paper mills was mostly done on a hand-to-mouth basis, and packers complained that this condition resulted in accumulating stocks, and price sacrifices.

Wood pulp held firmly during the major part of the year, and easily led all the other materials that enter into the manufacture of paper. The better grades of waste paper remained steady, but the lower grades were unsettled, and varied with the fluctuating demand. Kraft paper, however, was in excellent request, and the quotations on this grade made a very satisfactory advance. Mixed papers, news, and manilas, were mostly quiet during the year.

The demand for rags was disappointing, and for the most part they reached lower levels than in the preceding year. The drop in roofing rags was attributed to curtailment of building operations. Buying of the better grades of new and old rags was light, resulting in lower prices as the year progressed. Incidentally, a substitute for rags was launched on the market. Although it has been tried by some of the mills, it is still in the experimental stage, and its success is not yet fully known.

Paper Makers' Chemicals in Greater Demand

During the entire twelve months of 1926, industrial chemicals used by the paper and pulp manufacturers were in unusually good request. Consumption was heavier than during the preceding year, although 1925 had been regarded as an exceptionally good year.

Production was generally kept at high water mark, and the output was absorbed readily, accumulations of stock being limited. Shipments against contract were well maintained throughout the year, and even during the summer months withdrawals proceeded at a normal pace.

No radical price changes were recorded during the year. While competition was keen at times, the market preserved a stable and generally firm tone. Spot demand improved during spring and the early summer months, and in some cases advances were registered, particulariy in the various soda products.

At one time during the year there was a shortage of spot supplies of salt cake. This product was in exceptionally heavy demand from the pulp manufacturers, and all the plants are reported to be well sold head. Prices of salt cake were firmly maintained during 1926 and there is little doubt that the future of this material is decidedly promising.

Contracts for the current year have been booked in satisfactory volume and at practically the same schedule that prevailed during the preceding twelve months. Few disturbing factors appear on the horizon, and a continuation of good business is confidently anticipated during the current year.

NEPCO SETTLING BASIN AND POWER HOUSE

The picture shows the Settling Basin, Baffles, Dykes and Power House at the extreme end of Nepco Lake, which water supply has just been finished by The Nekoosa-Edwards Paper Company at a cost of $500,000. The Settling Basin has a settling capacity of eighty millions gallons per 24 hours, from which the water is pumped at the rate of 15,000 gallons per minute to the John Edwards and Alexander Mills at Port Edwards, Wis., to produce pulp and paper.

Year of New Records in the News Print Industry

Both the United States and Canada Considerably Increase Their Production in 1926, But Canada for the First Time Definitely Assumes the World's Leadership With a Production of 1,882,000 Tons, While the United Sates Produces Only 1,687,000 Tons—Grand Total of 3,768,000 Tons Are Produced on the North American Continent—Canada Installs 48 and United States 11 New Machines Since 1919.

Abstract of Report of R. S. Kellogg at Annual Meeting of News Print Service Bureau

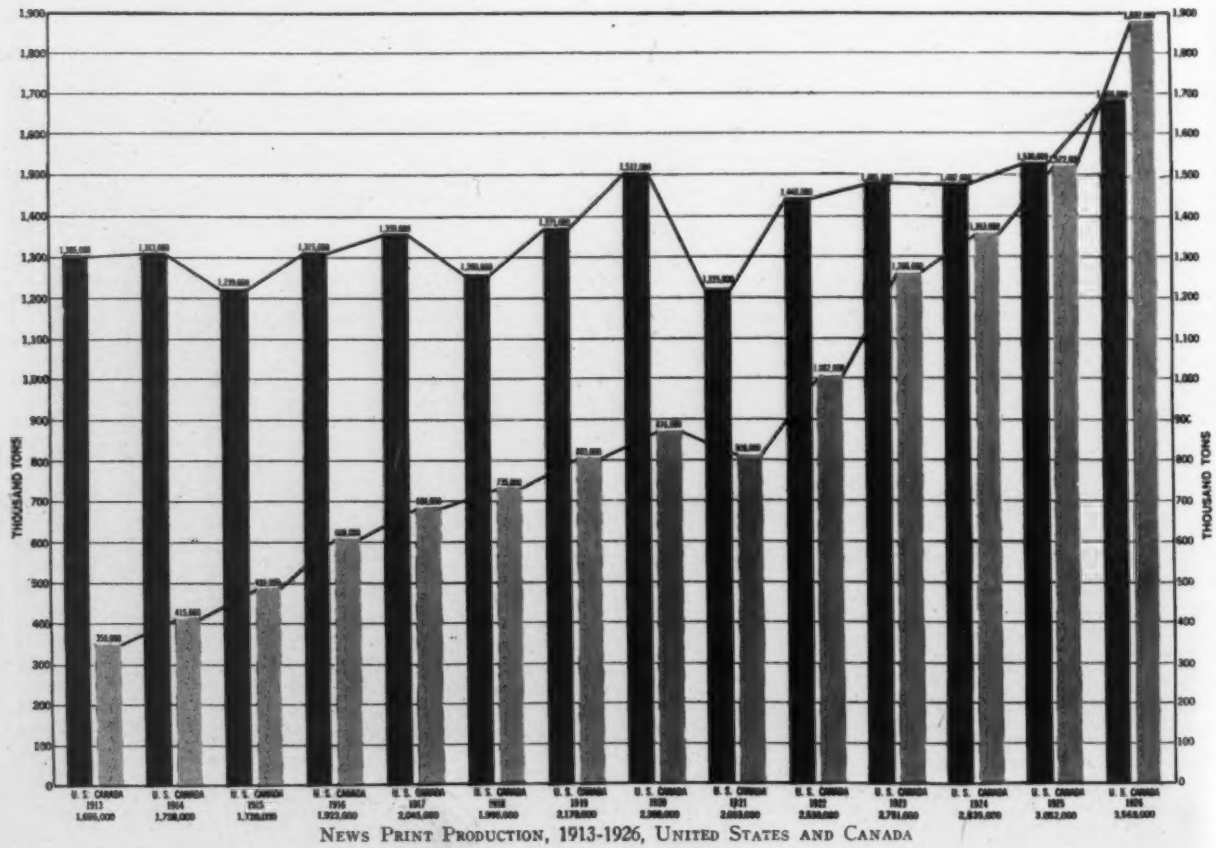
The year 1926 definitely gave Canada world leadership in news print manufacture and still further accentuated the United States as by far the greatest user of that article. With a total North American production of 3,768,000 tons, Canada furnished 1,882,000 tons, an increase of 24 per cent over 1925 and surpassing by 195,000 tons the output in the United States. But while this was going on, the production of the United States mills was 1,687,000 tons and greater by 156,000 tons or 10 per cent than the previous high record of 1925, while there was a gain of 93 per cent in Newfoundland as new operations got into full swing in that country and brought the total up to 186,000 tons. Even the production of 13,000 tons of news print in Mexico was 6 per cent over the previous year. The total North American production of news print in 1926 was 600,000 tons or 19 per cent ahead of 1925 and was made possible by the high operating record of 96 per cent of rated capacity.

Available for Consumption

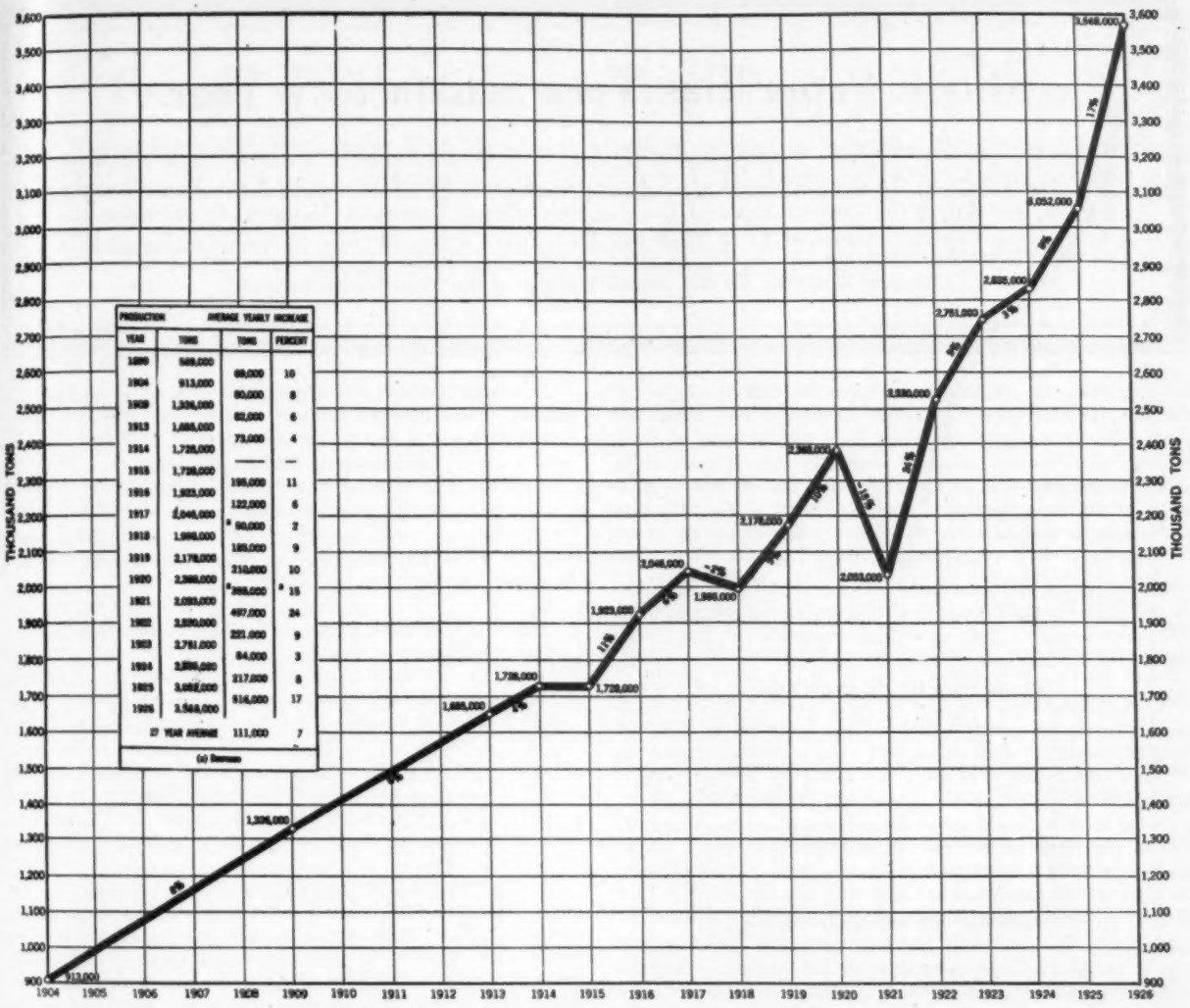
News print available for consumption in the United States in 1926 was, in round numbers, 3,500,000 tons or 18 per cent over 1925 and 56 per cent of the world consumption of this commodity. Into this total went all but 19,000 tons of the United States production, 49 per cent of the Newfoundland production, 88 per cent of the Canadian production, and 102,000 tons of overseas news print. However, importations of European news print which began in 1920 and reached 200,000 tons in 1923 have been steadily declining since that year and will probably go still lower in 1927.

Actual Consumption of News Print

Probably not far from 100,000 tons of the available supply of news print in the United States in 1926 went into stock so that the actual consumption was around 3,400,000 tons or at the rate of 58 pounds per capita compared with 52 pounds in 1925. This was an increase of 12 per cent in per capita consumption and 14 per cent in total consumption or twice the average increase during the past 25 years. Such use of news print last year was the climax of steadily increasing sizes and circulations of daily and Sunday



NEWS PRINT PRODUCTION, 1913-1926, UNITED STATES AND CANADA



NEWS PRINT PRODUCTION, UNITED STATES AND CANADA

newspapers. The growth in size is due to the increased volume of advertising, which in 1926 surpassed the previous record by 5 per cent and to the addition of many special features and special sections to suit the varied taste of the reading multitudes. Growth in circulation is the result of vigorous extension campaigns on the part of publishers, of improved mail facilities and of the steadily growing number of people who naturally buy one or more newspapers daily.

Circulation of Daily and Sunday Papers

Circulation of the English language newspapers in the United States now totals 36 million copies of the daily issues and exceeds 24 million copies on Sundays. During the past year, the circulation of the daily papers increased nearly 7 per cent and that of the Sunday papers almost 5 per cent. In 1926, the newspapers in the class of 100,000 circulation and over, averaged 31 pages daily and 111 pages on Sunday, compared with 23 pages daily and 79 pages Sundays in 1920. It is, of course, not reasonable to expect a long continuation of such rapid increases.

Addition of News Print Machines in 1926

From the beginning of 1919 to the end of 1926 additions to the news print manufacturing industry in North America totaled 64 machines with a rated capacity of 4,800 tons. Of these 5 machines were installed in Newfoundland, 11 in the United States and 48 in Canada. Counting in the installations now nearing completion, the North American news print machines, by the middle of the present year, will have a daily capacity of 15,000 tons. Over a long period of time the industry has produced at an average of about 90 per cent of rated capacity. On this basis, if all the present machines stay on news print, there will be a continental production capacity somewhat in excess of 4 million tons per year by the third quarter of 1927.

LINCOLN PAPER CO. IMPROVEMENTS

The increased demand for special grades of paper in Canada has led the Lincoln Pulp and Paper Company, Ltd., Merritton, Ont., to undertake a series of improvements which include the installation of new equipment. Several changes are being made on the Fourdrinier machine at the Lybester mill and these changes necessitate increased beating capacity which will be taken care of by rebuilding their present beaters into the New Type, heavy consistency, Dilts beaters. Improvements at the Lincoln mill call for four complete Dilts New Type beaters with siphon washers and will increase production of high quality rope papers. The beaters will be driven by individual motors equipped with latest type recording instruments. K. S. MacLachlan, general manager, is giving considerable attention to these improvements and the mills under his supervision seem destined to be among the most modern specialty mills in the Province.

Book Paper Has Very Satisfactory Year.

Although Consumption Was Apparently Slightly Lower Than the Capacity of the Mills These Were Able to Operate in the Neighborhood of 95 Per Cent—During the Slack Season Some Manufacturers Quoted Low Prices for Current Business But Contract Prices Remained Uniform Throughout the Year. New Contracts Renewed $2 to $3 Below Last Year's Prices Because of New Machines Added.

Written Especially for the Annual Number of the Paper Trade Journal.

In reviewing the book paper industry for 1926, it can be said that the manufacturers of this line enjoyed a very satisfactory year. The consumption apparently was slightly lower than the capacity of the mills. However, the mills were able to operate in the neighborhood of 95 per cent which was perhaps doing as well as any other division of the paper industry and fully eqaul to the average maintained in all manufacturing industries.

Large Users Busy

The magazines and periodicals that are the greatest consumers of this grade of paper, enjoyed a large advertising patronage, and circulation seemed to keep up to a satisfactory point, many showing a sound and substantial increase.

Prices Firm for Most of Year

Prices remained firm for most of the year with very few exceptions. During the middle of the summer when the industry was passing through its slack season there was a tendency on the part of some manufacturers to quote low prices for current business, but contract prices maintained uniformity throughout the year.

Owing to an increased production brought about by the installation of new machines, the tendency in renewing contracts was for lower prices which perhaps showed an average of $2 to $3 below the prices at which contracts were placed a year ago.

Constantly Increasing Production

Production of book paper has been constantly increasing. As near as can be estimated, the production for the year of 1926 was in the neighborhood of 1,500,000 tons, which represents just about the amount of paper that was consumed in that period. This production could have been increased somewhat had the demand warranted it, but notwithstanding this situation, the consumption must be looked upon as being highly satisfactory.

Fewer New Machines in 1927

There seems to have been some cessation in the installation of new machines for 1927. While there are several new machines to be installed, the estimated increase in production for 1927 will be only in the neighborhood of 5 per cent over the capacity for 1926. As the outlook for increased consumption is most satisfactory from the amount of advertising that has already been contracted for by the National advertisers with the magazines and periodicals, it would seem that the consumption will keep pace with the estimated increased production.

Publisher Optimistic

One of the largest publishing houses has recently issued a circular with reference to its own publications, in which it says:—

"Their advertising pages permit a rapid, timely survey of what business is thinking, planning, doing.

"Here is reflected accurately how the keenest minds in the country view the outlook—men who back their opinions with money.

"They have made it possible for us to enter 1927 with the largest volume of advertising we have ever booked for a year ahead—more of it on a twelve month basis—more of it in color.

" Coming from many diversified lines of industry, representing the combined judgment of industrial and banking leaders, this volume is more than the prophecy of a nation holding its own—it is a forecast of further national growth."

Encouraging Outlook for 1927

Altogether it would seem that the outlook for 1927 is most encouraging and if the general sound business conditions in the United States continue throughout 1927, the book paper manufacturers should feel assured of operating to a degreee that will be entirely satisfactory to the industry.

NEW PULPING PROCESS FOR HARDWOODS

A new pulping process which produces a high yield of cheap print paper from hardwoods and offers the possibility of shifting the burden of news print production from spruce, which is being imported in large quantities, to the hardwood forests of the North, East and South, has been developed at the Forest Products Laboratory at Madison, Wis., according to the Forest Service, United States Department of Agriculture. Through the use of a rod mill, a hollow, horizontal, steel cylinder half filled with steel or bronze rods, hardwood chips are reduced to fiber by rotating the cylinder.

The substitution of the rod mill processing for a certain amount of chemical treatment brings about a high yield by reducing the amount of fiber which would go into solution in the treating liquors in an all-chemical disintegration, the Forest Service points out. The distinctive feature of the new, or semi-chemical process, is that only a mild chemical treatment is used before the wood in the form of chips, is reduced to the proper pulp consistency in a rod mill.

Paper of the weight and thickness of news print made wholly from semi-chemical pulp of black, tupelo, or red gum, or aspen, birch, or maple, was found to have a greater strength than the present commercial news print. In the case of gums, the department indicates that provided black and red heart-wood have been excluded, the color of the paper can be made to equal or excel that of standard news print.

Pulp made by this new process from aspen and birch can be substituted for over 50 per cent of the standard news print mixture of ground wood and sulphite pulp wthout sacrifice of quality. In fact, the Forest Service points out that ground wood pulp and the new semi-chemical pulp can be combined without sulphite pulp, although the sheet made without sulphite is rather weak when wet and requires care in handling on the wet end of the paper machine.

The introduction of semi-chemical pulp from aspen and birch and possibly maple should assist materially in continuing the news print supply in the northern and northeastern regions. The supply of gum in the Southern States offers an excellent opportunity for the development of a print paper in a region which has hitherto been excluded from serious consideration for the purpose because of lack of spruce and hemlock for ground wood and for sulphite pulp.

Record Production of Fine Papers in 1926

Writing Paper and Cover Paper Experienced One of the Best Years in Volume of Business in Their History—Tissue Paper Disturbed by Chaotic Condition of Prices Which However Stabilized in the Fall—Comparatively High Cost of Fine Papers Accounted For by Continued High Cost of Manufacturing and Living Expenses—Twenty-eight Paper Machines Installed in 1926 as Against 24 in 1925.

Written Especially for the Annual Number of the Paper Trade Journal by E. H. Naylor, Sec.-Treas. of the Writing, Cover and Tissue Paper Manufacturers Association.

Conditions in the fine paper market for the past year of 1926 and up to the present time, are not dissimilar to those existing in 1925. It is rather remarkable that the two years should be so very much alike. By reference to the fine paper market is meant writing, cover and tissue papers in their various grades.

Record Production of Writing and Cover

The writing paper and cover paper markets experienced one of the best years in volume of business in the history of the industry —in fact, the writing paper mills never made or shipped more paper or reported a larger volume of sales at any previous time. However, this should not be taken as indicative of unusual prosperity, because the mills absorbed high costs in their quotations, and therefore profits for the year were only fair.

Last fall the market experienced a reduction in some sulphite bond grades which naturally had a retarding influence for a short while, but the market made a remarkable recovery as soon as it was appreciated that the change made on some sulphite bond grades would not affect, because of high costs, the rag-content papers.

In the tissue paper market a regrettable condition existed because on both sheet and toilet paper, prices were in a most chaotic condition all through th early part of the year and did not begin to stabilize until in the fall. This so-called stabilization came about through the insistence in individual cases of receiving quotations which might be accepted from a mill as indicative of its quotations for at least a month or two.

It is sometimes wondered why the prices of certain grades of writing and cover papers should remain so high in comparison to those that obtained back in 1915. In the first place, labor is receiving today 132 per cent more wages than in 1915, and all costs are higher, not only for the manufacture of fine papers, but for actual living expenses.

In papers, however, that use rags extensively, an interesting situation has arisen through the influences of three other industries seemingly far removed from the paper industry: women's wear, automobiles, and motion pictures.

Women are wearing fewer clothes, and what few they do wear are seldom made of cotton or linen, but are generally silk which is useless for paper-making. Men who drive automobiles are constantly going into their homes and taking out old rags for washing or wiping purposes, which makes them useless for paper-making through the presence of grease or other matter. The diversion of rags for this use runs into thousands of tons a year. The motion picture industry demands millions of feet of film which are made cut of new collar and shirt clippings, and other high grade rags, for which the manufacturer of films will pay a price which is absolutely prohibitive for the manufacture of paper.

So it can be seen that although these three industries—women's wear, automobiles and motion pictures—seem quite unrelated to the cost of making paper, yet they do have a very direct effect upon it.

A Summary of Production

Production of fine papers for 1926 might be briefly summarized as follows:

In writing paper there were no extreme ups and downs in production in 1926. Production followed orders rather closely. Orders increased in January of last year, and then began a gradual decline until the first of July when they improved slightly, declining again the first of September, and then returning with the full business, but dropping off again in December. Sales for 1926 were 4 per cent higher in dollars and 6 per cent higher in tons than in 1925. Compared with 1924, the sales for the year just ended were 10 per cent higher in dollars and 17 per cent higher in tons. Janu-

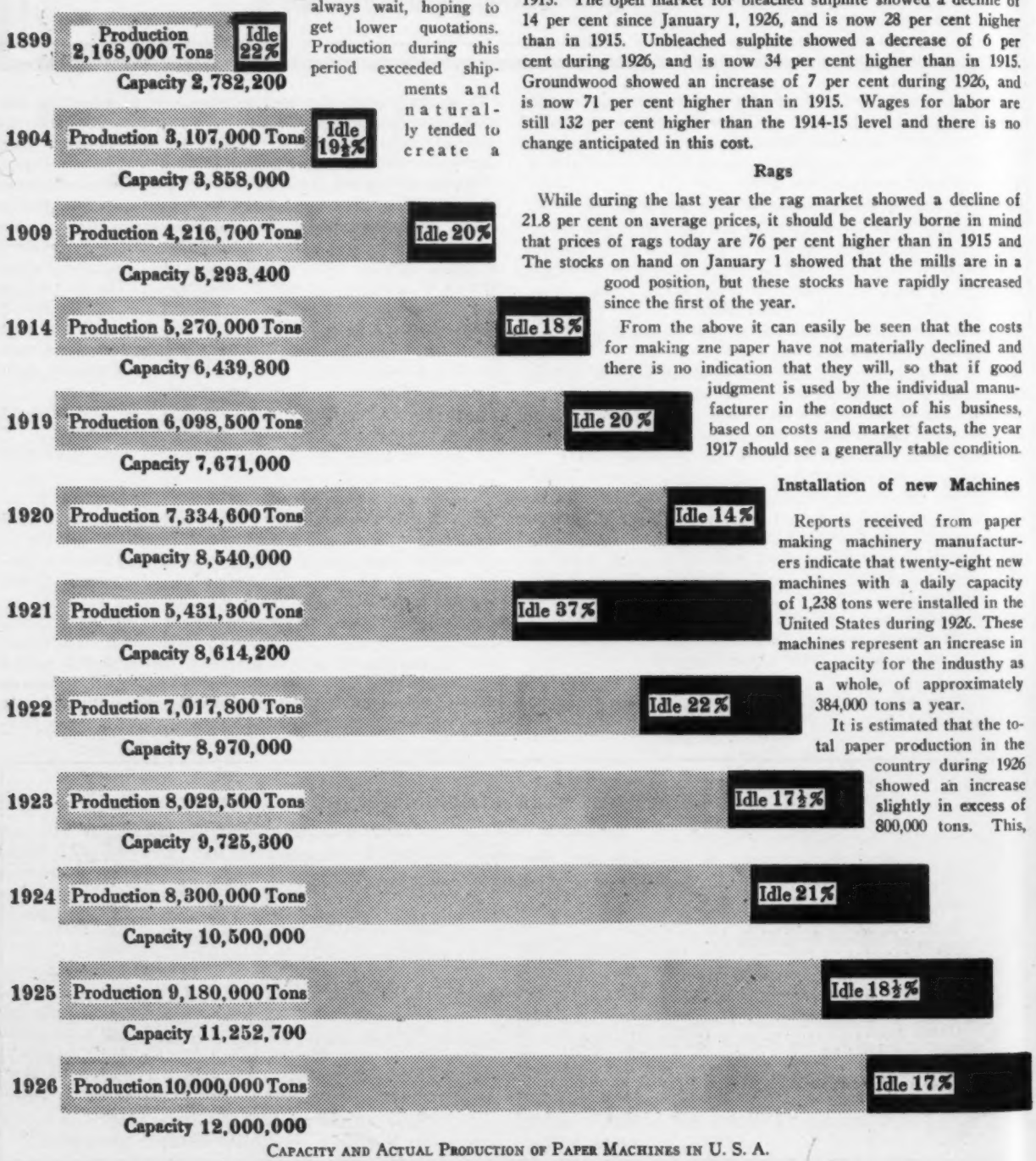
INSTALLATION OF NEW PAPER-MAKING MACHINES IN THE UNITED STATES

Grades	Installed in 1924		Installed in 1925		Installed in 1926	
	No. Machines	Capacity 24 Hours	No. Machines	Capacity 24 Hours	No. Machines	Capacity 24 Hours
News	1	60	0	0	1	75
Book	3	165	8	335	12	525
Board	6	355	3	270	2	190
Wrapping	9	310	9	322	8	365
Writing	1	30	2	16	0	0
Tissue	8	127	1	25	2	45
Hanging	0	0	0	0	0	0
Felts and Building	1	75	1	30	0	0
All Other	4	67	0	0	3	38
Total	33	1,189	24	998	28	1,238

ary and February business has opened with demand more active than was anticipated.

Cover paper enjoyed a more even flow of business, although the fluctuations in that market were very similar to those in writing paper. Sales for 1926 were 5 per cent higher in dollars and 4 per cent higher in tons than those of 1925. Compared with 1924, the sales for the year just ended were 9 per cent higher in dollars and 8 per cent higher in tons. Demand so far this year has been slightly above normal.

In tissue paper orders declined the early part of 1926, due in a large degree to the uncertainty of the market as to quotations. People will not buy when they cannot get stable prices, and will always wait, hoping to get lower quotations. Production during this period exceeded shipments and naturally tended to create a weak market. This was the difficulty in this branch of the industry until mid-summer when production declined somewhat and demand increased considerably, giving the market a more healthy tone. Demand fell off in the latter part of the fall and production fortunately declined also, but was maintained somewhat above shipments. January business opened with a fair demand. Market conditions of the future seem to rest almost entirely with the adjustment of production to demand.



CAPACITY AND ACTUAL PRODUCTION OF PAPER MACHINES IN U. S. A.

Raw Materials

Throughout the year, the contract price of bleached sulphite remained the same, which is 80 per cent higher than it was in 1915. The open market for bleached sulphite showed a decline of 14 per cent since January 1, 1926, and is now 28 per cent higher than in 1915. Unbleached sulphite showed a decrease of 6 per cent during 1926, and is now 34 per cent higher than in 1915. Groundwood showed an increase of 7 per cent during 1926, and is now 71 per cent higher than in 1915. Wages for labor are still 132 per cent higher than the 1914-15 level and there is no change anticipated in this cost.

Rags

While during the last year the rag market showed a decline of 21.8 per cent on average prices, it should be clearly borne in mind that prices of rags today are 76 per cent higher than in 1915 and The stocks on hand on January 1 showed that the mills are in a good position, but these stocks have rapidly increased since the first of the year.

From the above it can easily be seen that the costs for making zne paper have not materially declined and there is no indication that they will, so that if good judgment is used by the individual manufacturer in the conduct of his business, based on costs and market facts, the year 1917 should see a generally stable condition.

Installation of new Machines

Reports received from paper making machinery manufacturers indicate that twenty-eight new machines with a daily capacity of 1,238 tons were installed in the United States during 1926. These machines represent an increase in capacity for the industhy as a whole, of approximately 384,000 tons a year.

It is estimated that the total paper production in the country during 1926 showed an increase slightly in excess of 800,000 tons. This,

FINE PAPER MARKET CONDITIONS IN 1926

	No. of Machines	Annual Capacity	Annual Production	Per Cent Capacity
1914	1,540	6,439,800	5,270,000	82
1919	1,545	7,671,000	6,098,500	80
1923	1,828	9,725,300	8,029,500	83
1924	1,861	10,500,000	8,300,000	79
1925	1,885	11,252,700	9,180,000	82
1926	1,913	12,000,000	10,000,000	83

then, would be one of the first years when production showed a larger increase than capacity of the new machines. However, when the addition to capacity by improvements and additions to existing equipment is considered, it is more likely that the increased capacity in 1926 was close to the increase in production.

There still remains considerable excess or idle capacity in the industry, because for so many years the tonnage added by new machines and improvements to old machines exceeded the increase in production. In the last three years, while production has shown the tremendous increase of 1,970,000 tons, the capacity of the industry was advanced by 2,275,000 tons.

No new writing paper machines were reported for 1926, but undoubtedly some tonnage has been diverted from other grades to sulphite bond.

The extensive building in the last few years in the paper board industry appears to have been halted for the time being. Only two new machines with a daily capacity of 190 tons were reported for last year.

Two new tissue machines with a daily capacity of 45 tons were reported. While this increase in itself is not large, it has possibilities for further aggravating the situation, because this branch of the trade is already over-burdened with far more capacity than it can use in the next few years.

Twelve new book machines with a daily capacity of 525 tons were reported for 1926. This is the largest increase in a single year ever reported for this branch of the industry, and is equal to over 10 per cent of the existing book paper capacity.

There were reported eight new wrapping paper machines with a daily capacity of 365 tons, which is the neighborhood of an increase of 5 per cent over the existing wrapping paper capacity.

News print continues to hold the center of the stage, as the demand for that grade continues unabated. Reports now show that the combined output of the mills in the United States and Canada for the first eleven months of 1926 were 17 per cent higher than in the same period of 1925. Production facilities are being considerably expanded, especially on the other side of the border. During 1926, eighteen new news print machines were installed, all but one in Canada, these having a daily capacity of 1700 tons. The additional production of the new machines has been absorbed by the market demands, and in addition, stocks on hand of finished paper have been drawn on to such an extent that news print mill inventories were equal to only 2.1 days production on November 30, 1926.

Important Facts

Although the total capacity of the industry in relation to production is interesting and important, the capacity and production by grades will disclose considerably more information. These facts are important for the executive in making decisions as to shifting of product or improving of buildings and equipment. The Census Bureau has gathered statistics of paper machine capacity by grades, which information will be issued shortly.

NORTH STAR MILLS ADD BEATERS

The North Star Strawboard Mills at Quincy, Ill., are completing extensive improvements which include a modern straw circulating and washing system using two large New Type beating engines built by the Dilts Machine Works, Inc., Fulton, N. Y., and equipped with three large size cylinder washers each. When this equipment is ready to operate, it will materially increase production of this mill, making it one of the most modern mills in the middle west.

TWO OF THE FOUR 234 INCH FOURDRINIERS INSTALLED IN 1926 AT PLANT OF PORT ALFRED PULP & PAPER CO., PORT ALFRED, QUE.

Wrapping Production Close to Normal in 1926

Only a Comparatively Few New Paper Making Machines Were Added in 1925 and as Most of These Were Devoted Mainly to Spcialties the Added Production Was Easily Absorbed—This Halt in Expansion Gave Consumption a Much Needed Chance to Catch up With Production—The South and Pacific Coast Becoming Important Factors—Prospects Point to Good Year for the Industry Generally.

Written Especially for the Annual Number of the Paper Trade Journal by I. Kuhe,
Vice Pres. Continental Paper & Bag Mills Corp.

Probably at no period since the war did consumption come closer to normal productive capacity in the wrapping paper industry than during the year 1926. This is not meant to convey that consumption had reached 100 per cent machine capacity, but that the margin between these factors was considerably reduced, removing to a great degree a dangerous factor from the market.

Compares Favorably With Other Industries

In the relation of consumption to productive capacity, the wrapping paper industry compares favorably today with most other industries. Various conditions have contributed to this result.

During the year 1925 only a few machines were added to the total and these mainly devoted to specialties. On the other hand, adverse price conditions caused a number of machines in the wrapping paper field to be abandoned and some to be dismantled. This is particularly true of mills owning water powers which had in recent years increased tremendously in value and found ready sale on profitable terms.

Additional Tonnage from Increased Efficiency

Accurate statistics are not available, but it is likely that any increase in tonnage during the year of 1925 came mainly through increased efficiency in mills already established.

It might be said that this halt in expansion in the year referred to gave the consumptive powers of the industry the chance to take a long step toward catching up with production. It has been asserted that the demand for wrapping papers—and in this must be included the product required by converting industries, such as bag, sack, envelope and other manufacturers—increases on an average of 5 per cent per annum. With the new uses which have been developed, particularly in the lines of kraft papers, among which may be enumerated kraft papers for cement and other sacks, in place of burlap; test liners for corrugated containers; papers for the electrical industry, etc. it is likely that the percentage of increase has been considerably larger than this during the past few years. It is not surprising, therefore, that the market of 1926 absorbed the additional product of the quite respectable number of machines that were installed during that year with ease.

Mills in New Locations

True to the saying that an industry will follow where cheap raw material, labor and power can be found, it was natural that a great majority of new mills should spring up in the South, which offered a number of locations affording cheap, fast growing wood and cheap fuel. The past year has conclusively demonstrated that the South is destined to play a dominant role in the coarse paper industry, and while by this time attractive locations have become scarce in that section of the country, there remains plenty of room for existing organizations to expand their capacity.

And on the Pacific Coast we have "another Richmond in the field." It will be interesting to watch that section of the country, which is just waking up to its possibilities, and which, through its enormous lumber industries, offers advantages to the enterprising paper maker which will make it a factor to be reckoned with in competition all along our coasts.

Marvellous Expansion in Kraft

The developments referred to have been mainly of the type manufacturing sulphate papers. It is safe to assume that the largest part of the growth in the wrapping paper industry has been absorbed by kraft mills; indeed, the growth of the kraft paper industry has in recent years been nothing short of marvelous.

But sulphite and ground wood papers still find their place in the sun; not for every purpose can kraft be used to advantage—this is particularly true of moist foodstuffs. Fastidious buyers of wrappings, such as department stores, textile manufacturers and so on, like to identify their commodities by wrapping them in papers of bright colors which kraft manufacturers are unable to produce. With a great many merchants light weight machine glazed sulphite papers, because they can be dyed in fine pastel shades, are becoming popular. So there is happily no danger that the entire wrapping paper industry will be transferred to the kraft column and therefore, as has been assumed by many, to the South.

Greater Efficiency Practiced in All Mills

It is daily becoming clearer that every section of the country has its advantages and ingenious manufacturers will know how to employ them to retain their share of the business. Greater efficiency is practiced in all mills; science is being pressed into service to a greater extent than ever and it would be idle to predict what changes the morrow will bring.

One thing is certain: if the United States wants to keep its leading position, the industry will need to tap all its resources, varying its products according to the possibilities of location. In this way, and in this way only, will both producer and consumer be benefited.

Prophecies Have Not Come True

After the war it had been generally feared that the country would be flooded with importations to the detriment of the domestic industry. This prediction has not come true; as a matter of fact, imports are at their lowest level. The reasons for this are easily found in the low prices which have prevailed in this country for the past two or three years and the general adoption of the gold standard in European countries coupled with the high taxes and rate of interest which burden foreign competition. Little danger threatens from that quarter as long as the industry retains the modest amount of protection which it enjoys at present.

During the end of 1926 the wrapping paper industry published a set of trade customs, filling a large felt need contributing toward the proper conduct of the business. With only a few exceptions manufacturers of wrapping papers have adopted these trade customs. They have been well received by jobbers and consumers.

As to the course of business in the current year, it is idle to spec-

ulate. The prophets who predicted special prosperity for the first part of 1926 with shrinking business in the second half were badly confounded; the very opposite became true. On the whole it may be said that the stage is set for a mighty good year. Industries are generally active, there is no lack of employment and with money easy, bulging savings bank accounts and low stocks in manufacturers', jobbers' and consumers' hands we seem to have every factor to insure a continued high demand for our products.

Marked Improvement in Situation

In a large and diversified country like ours, the pessimist can always find some dark spot to point to, such as the Florida situation, the installment plan scare or a slight decrease in building operations, but having taken stock of these apparently detrimental issues, we find on the right side of the ledger a marked improvement iin the situation in the agricultural sections and important industries like textile and leather. With fears of panic removed by a beneficient banking law, and with a domestic market of nearly 120 million people living on the highest plane in the history of mankind, we have every right to look forward to a continuance of the general prosperity of 1925 and 1926. Even should some unforeseen event or political disturbance, which is not beyond probabilities in a year before the presidential election, cloud the bright skies for a moment, the underlying conditions of general prosperity and the unbounded optimism of the American businessman will quickly assert themselves and restore confidence.

TO BUILD PULP TERMINAL AT DEXTER ..

One of the most important industrial enterprises to be undertaken in Jefferson county in years will be begun in the spring by the Dexter Sulphite, Pulp and Paper company, of Dexter, N. Y. Drs. James E. and Clarence W. Campbell, owners of the mill has announced that a pulp terminal will be established by their company on the Pillar Point shore of Black River bay, a standard gauge railroad being extended three and a half miles from Dexter to the docks.

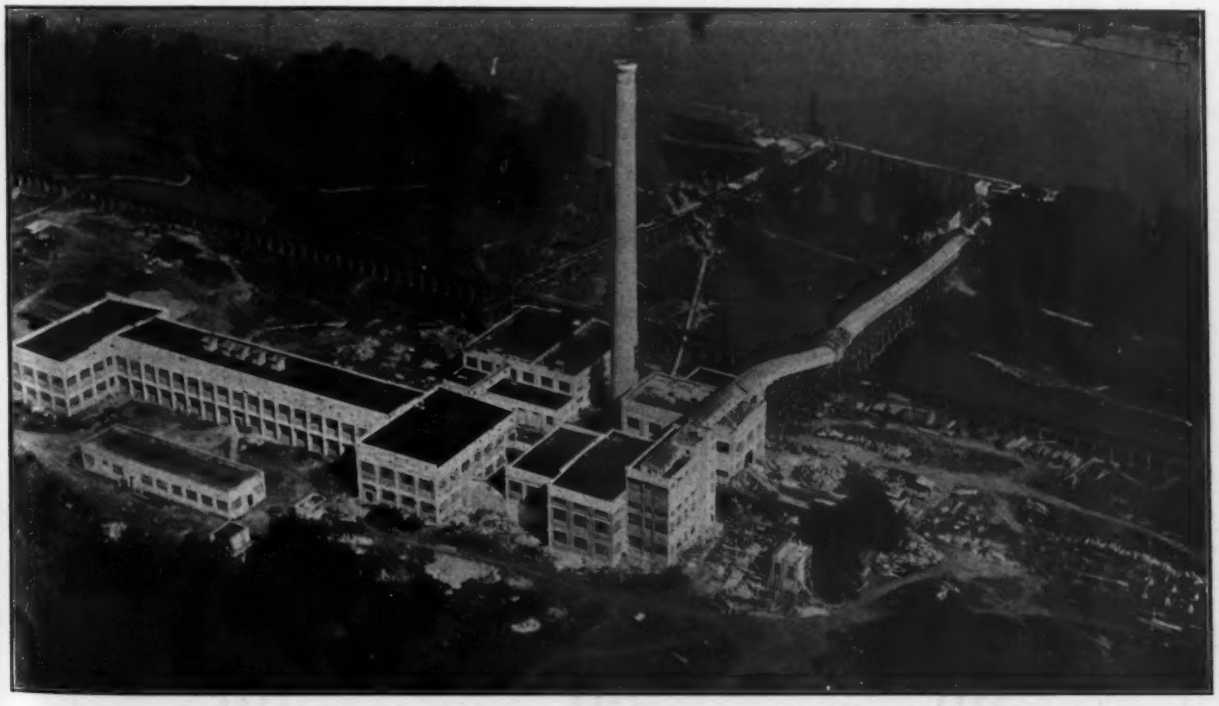
Construction of railroad, piers and unloading and loading devices is estimated to entail an expenditure of a quarter of a million dollars. The development will give employment to from 150 to 200 laborers and after completion will add fully 40 men to the pay rolls of the Dexter Sulphite company. To supply transport between its plant and its pulp wood terminal, the corporation will increase its rolling stock to 100 cars, besides maintaining a locomotive.

The rail portion of the project actually will represent an extension of the Dexter and Northern railroad, created by the Dexter Sulphite, Pulp and Paper company a number of years ago to feed its mill after shortage of timber in the headwater region of Black River caused that stream to be closed as a course of wood transport, and bars and other obstructions prevented access to Dexter by barges from Lake Ontario. The present railroad connects with the New York Central system at Dexter Junction on the Cape Vincent branch and joins tracks of the Black River Traction company at the outskirts of the village, both systems utilizing the same rails through the village streets.

About three and a half miles of track will be laid from the present Dexter and Northern road. Construction will continue all of next season, it is expected. Surveys for the road now are being taken.

From 100,000 to 150,000 cords of wood will be ground by the mill each year and this amount will be handled through the terminal and over the railroad. The pulp wood will be brought to Pillar Point from below Quebec, being handled by freighters capable of carrying some 1,200 cords, or approximately 180 tons. The boats are about 250 feet long by 80 feet beam. Ocean tramps occasionally engage in the pulp wood trade. The docks will have an adjacent depth of water of 20 feet, and if necessary the bay will be dredged to this depth.

Creation of a lakes-to-the-sea canal through the St. Lawrence would give the Dexter mill direct communication through its terminal with the world at large. It would permit, with slight expansion to accommodate larger ocean going craft shipment of paper machines, for instance, from the Bagley and Sevill mill by short rail haul and direct to foreign customers.



KRAFT PAPER AND SULPHATE FIBER PLANT JUST STARTED BY THE ST. HELENS PULP & PAPER CO., AT ST. HELENS, ORE.

Heavy Production Of Paper Board During 1926

With Declining Price Levels the Industry Has, However, Adjusted Itself Badly To the New Order of Merchandising Which Has Been Prevalent Since the Summer of 1925—Paper Board Industries Association, Which Includes Practically All the Representative Board Concerns, Is Doing Good Educational Work in Endeavoring to Improve Conditions of the Industry—Greater Profits Looked for in 1927.

Written Especially for the Annual Review Number of the Paper Trade Journal by Grafton Whiting, Statistician, Paperboard Industries Association

The year 1926 in the paper board industry has been one of large volume but declining price levels. The fallacy of striving for orders and full plant operation at the expense of profits has swept through the industry until sales have been made in many instances at cost and in some cases at a distinct loss.

Hand to mouth buying with the accompanying small size orders, quick delivery, and many special requirements, has increased the cost to box makers who cannot in turn apply the same practice to any considerable extent in the purchase of their raw materials.

On the whole the industry has adjusted itself badly to the new order of merchandising which has been prevalent since the summer of 1925.

The Paperboard Industries Association is composed of three groups of members: the paperboard or mill group, the corrugated and solid fiber container group, and the folding box or carton group. The first of these is engaged in the manufacture of board which is used subsequently by the other two as their raw material in box making.

It is one of the functions of the Association to record through its gathering of statistics the activities of the three branches of the industry it represents, and at its meetings to present the facts and point out the tendencies as an aid to its members in forming their business policies. That this function has had its effect is evidenced by the fact that while the craze for volume has been prominent and competition keen, a better spirit of cooperation exists and policies have been shaped with a less selfish end in view than in the past.

Volume

In 1925 the corrugated and solid fiber container group, the largest consumers of box board, made a gain of over 16 per cent in tonnage volume above 1924. The year 1926 will register a further gain of some 10 to 12 per cent, it is estimated, when the final figures are accumulated. Much of this increase is due to the Sales Promotion division of the Association's activities. Six members of the staff, selected for their ability to analyze market possibilities are at work in many industries throughout the country demonstrating the practical use of fiber containers and folding boxes as the safest and best means of protecting merchandise in its journey from manufacture to its final consumption by the public.

This work is undertaken largely through trade associations where open discussion may be had at their meetings; and through addresses by the sales promotion representatives and the minutes of the meetings, country wide publicity may be obtained.

Already thousands of tons have been added to the yearly demand benefiting the member box makers and in turn the member board mills supplying the raw materials; the effect of this work is cumulative as more and more of the individual shippers come to realize the safety and economy of the new type of package.

Demand is dependent upon such a multitude of industries that the statistical trend of paper board and paper board products has become a barometer of general business activity. The demand for shipping cases is in direct proportion to the amount of outgoing product of the shipper and can be no less and no more, since it is uneconomical to make purchases far in advance or in excess of anticipated requirements. A seasonal demand is the result—with the greatest activity in the early spring and fall months. This makes for irregularity in plant activity which is difficult to control. However, the year 1926 exemplifies what can be done in a seasonal industry to reduce the peaks and build up the valleys by bringing the conditions to be met before the manufacturer.

Chart No. I shows in graphic form the hours of operation in the board mills expressed in a percentage of the actual time of operation as compared with the possible full time. It will be noted that with the exception of December—when a number of mills were shut down for repairs, holidays, inventory taking, etc.—the

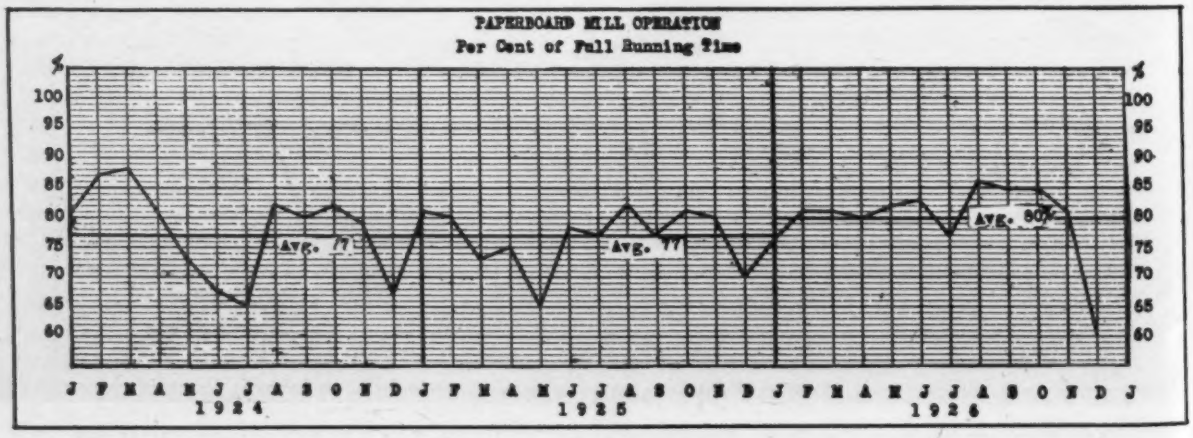


CHART I.

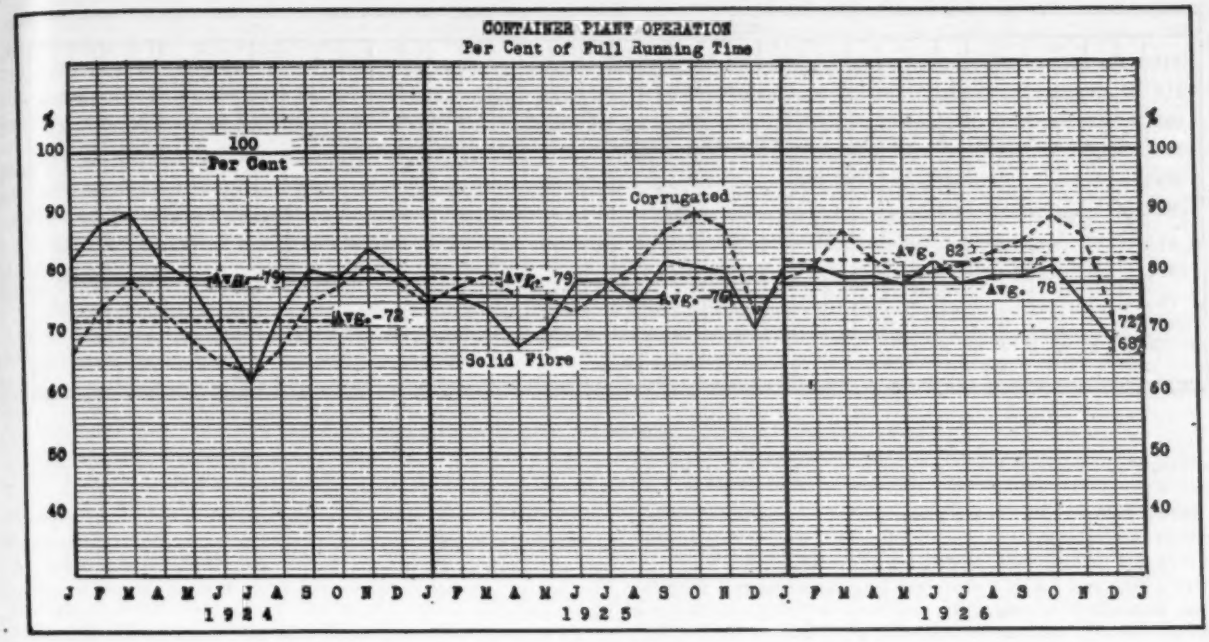


CHART II.

variation in the percentage of running time did not exceed 10 per cent between the high point in August of 86 per cent and the low point in January of 77 per cent. The late spring or early summer reduction experienced in previous years was much modified, and the peak months continued longer and at more consistent levels than in 1924 or 1925.

Chart No. II gives the percentage of operating time in the container group divided between corrugated and solid fiber production. Here again the spread is less than 10 per cent between the high and the low months, barring December, when the same causes as mentioned above for the mills were in effect in the container plants.

Chart III illustrates the activity in the folding box group and is here divided between the East and West. Unfortunately, experience for the full year of 1925 is missing, but from previous records, it is apparent that less operating fluctuation occurred in 1926 than in previous years.

Some of the indirect benefits of stability in volume are worthy of mention. Labor in the industry for the past year has been more constantly employed, resulting in less labor turnover and more regularity in payrolls. The productivity of labor has been greater with the average output per hour less fluctuating. A steady pressure of orders on hand, particularly where piece work or wage incentive payments plans are utilized, if favorable not alone to the operators but to those responsible for the plants' efficiency. The quality of the product becomes better standardized where a degree of regularity replaces a feast or famine of orders. Better planning of work can be had and savings in costs realized where a reasonably steady flow of work can be anticipated.

Prices

Unfortunately the members of the paper board industry discounted all of these savings and made such low prices for their product that all the economies gained were passed over to their customers. A total disregard of the unusually strong demand seemed to spread over the sales force in making quotations.

Chart IV represents the average price levels and the average volume during the past three years of paper board operations. Prices—the broken line—are a composite of the market value of the principal grades of board commonly made. Volume—the solid line—is determined by a review of the output of mills controlling some 65 to 75 per cent of the total production. In order to harmonize the two sets of figures in each series, the 36 months' figures were added together and the average was designated as a base 100 per cent. This monthly average was then divided into

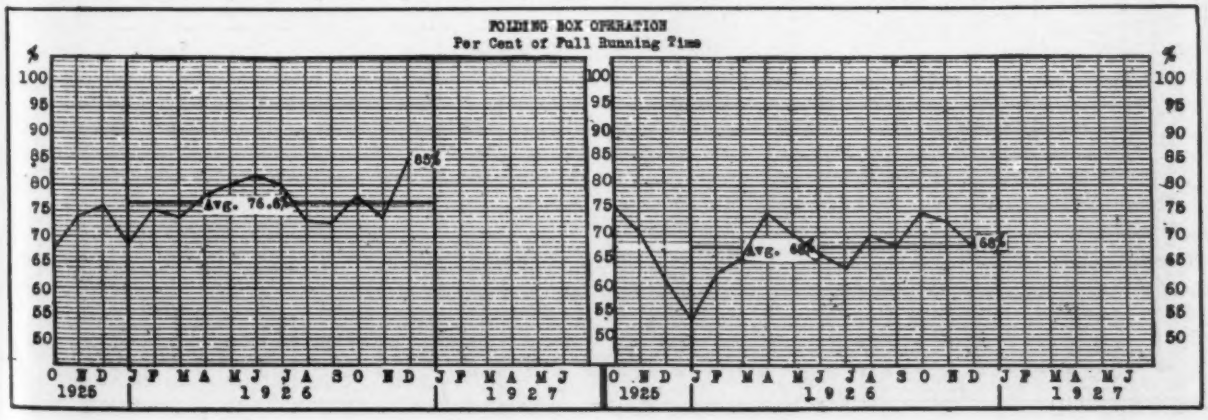


CHART III

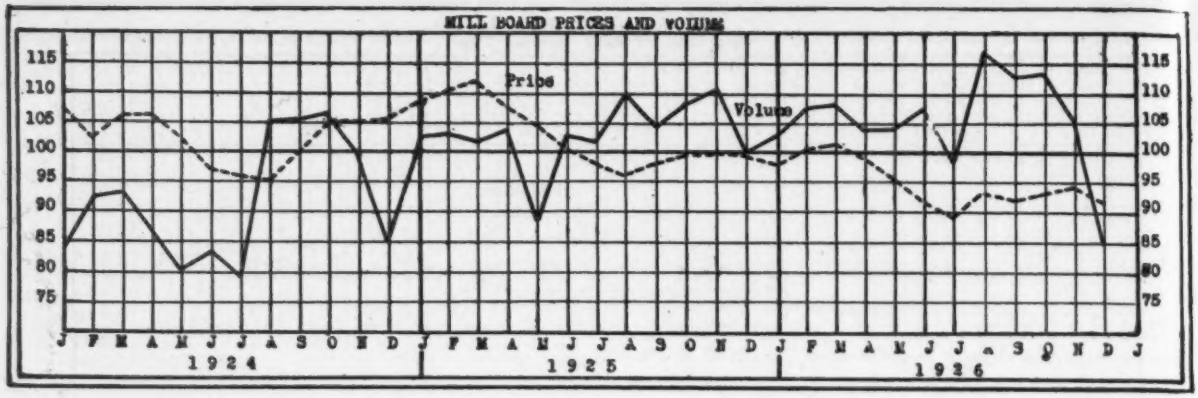


CHART IV.

the actual and expressed in a percentage above or below 100 per cent.

During 1924 and 1925 board prices tended to respond to volume in their general swings and until the middle of 1925 the price level ranged for the most part above the volume line.

For a year and a half volume has been mounting and the price level, particularly during 1926, has been declining. Relationship between the two can still be seen with a dip in both lines in July and an increase in the early fall months.

Chart No. V is a contrast of price and volume in the corrugated box division of the industry and the lines as plotted were determined in a manner similar to that for the board mills—a 36 months' average was used as a base and the actual for each month expressed as a percentage of the base.

The change in the relationship of volume to price is more pronounced here than in the previous chart. The middle of 1925 marked the beginning of the new tendency; but unlike the board situation little or no effect on prices is exerted by the volume trend during 1926. From March to June container plants made a small margin of profit because the price of their raw material was declining faster than the prices of their finished product, but for the remainder of the year, in face of strong demand, losses were sustained by many plants that more than offset the previous gains.

Association Activities

As usually occurs when sharp competitive bidding exists, the box manufacturer has every incentive to cheapen his product by lowering the quality and substituting materials less able to stand the rough usage to which it is exposed. Such a practice is recognized by the association as being detrimental to the best interests of the industry. To meet this situation, special inspectors are employed to visit different sections of the country and through comprehensive tests maintain a policing of the quality of output in all members' plants, and furthermore to search for under-test boxes made by non-members and bring them to proper attention for correction.

As a further endeavor to provide safe packages and to protect the shipper from loss or damage to this product while it is in transit, the association has established testing and designing laboratories in charge of "Package Engineers" whose duty it is to construct and specify the type of box and interior supports necessary to secure safety to the contents not always sufficiently protected by the usual styles of boxes.

The difference in seasonal demand brings many problems to plant management in adjusting facilities between excessive demand and slack or idle periods. Perhaps the most troublesome of these pertain to costs and general accounting. The association maintains on its staff accountants trained to install cost accounting in its members' plants and the year 1926 saw a number of additional installations undertaken and completed.

Another activity is that of the traffic department which collaborates with the railroads and other carriers in determining just regulations governing freight and express shipments. A few of the topics dealt with cover shipments in corrugated or solid fiber containers of inflammable liquids, strike anywhere matches, export or water route shipments, etc.

An ambitious program has already been mapped out for 1927

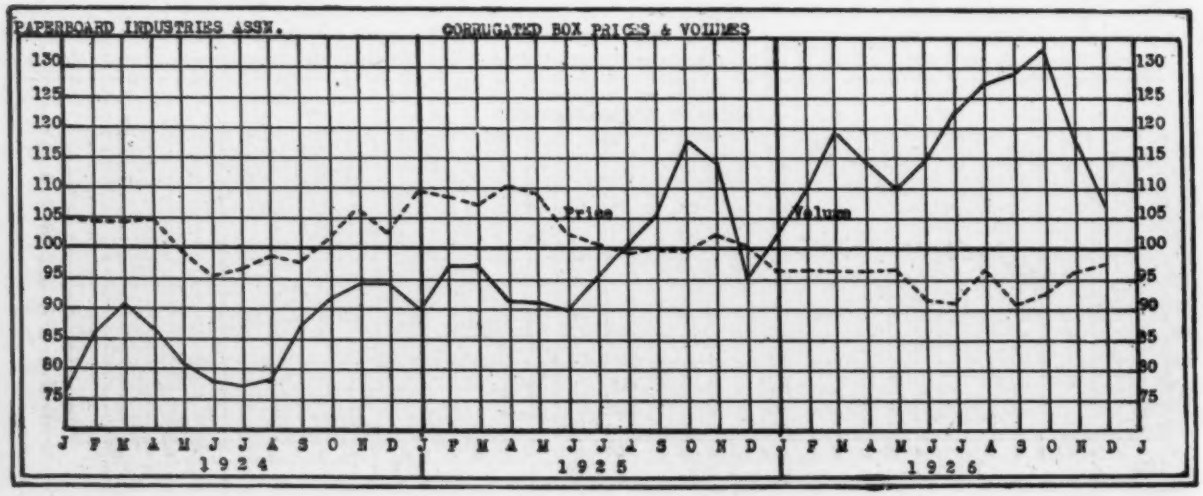


CHART V.

which deserves the active support of every box board mill, container and folding box manufacturer in the country.

The value to be obtained by a review of the past lies principally in the light it will throw on the future, as past experience is the greatest factor in forming business policies. If better conditions are to prevail they must come about from changes in the individual plants of which an industry is composed. If each manufacturer refers solely to his own experience and local environment, general changes are slow of accomplishment, but if he will be influenced by conditions of the industry as a whole, and find his relationship to it, he will adopt a broader gauged policy and will cooperate more fully with others for general betterment.

The year 1927 opens with a more stabilized market price level for box board, and an average box price more nearly in keeping with good merchandising. Box makers have learned that in the long run box prices follow board prices and that if they are kept closely in alignment one of the causes of loss will disappear. They have found that the stabilization of box board means the stabilization of boxes and that severe and frequent fluctuation engender losses even to the point of depletion of capital.

During 1927 effort will be made on the part of the box makers to assist the mills in overcoming the sharp changes in demand for board and consequent irregularity in running time and output. This will have a beneficial effect on board prices and in turn will aid in stabilizing box conditions, since some 70 to 80 per cent of the box cost consists of the raw materials used.

The volume for 1927 viewed from all angles should be well in excess of 1926. General business forecasts predict a continuance of manufacturing activity for at least six months; and the outlook for easy money and ample credit is favorable for the rest of the year. It is too early to predict what the crop situation will be and its effect on the last six months of the year, but barring a severe failure the year 1927 is marked for prosperity.

The paper board industry, while dependent on general business, is awake to its possibilities and through its association is broadening its field of activity by seeking new outlets for its product and increasing consumption where partial use only now obtains. The cost of making board and boxes is being studied more closely and is being reduced by increased tonnage per unit and greater plant efficiency. Over-production capacity still exists and will for some years to come, as growth in demand has not overtaken increased plant productivity.

RAINIER PULP & PAPER CO. ERECTS MODERN MILL

The Pacific Northwest's newest and most modern sulphite mill is both practically and beautifully situated. In the shadow of Washington's famous and lofty Mount Rainier it was logical that the name of this new development should be the Rainier Pulp and Paper Company. Just twenty miles from Washingtons Capitol on Puget Sound and with the heavily wooded Olympic Range foothills in the background, it is truly a picturesque setting. The mill boasts a dock of its own and in addition is served by the Northern Pacific Railroad.

Chips brought in by barge are handled with gantry crane clamshell buckets to storage, dryers, or directly to elevating conveyors over digester bins. A trestle over deep hoppers allow gondolahrd to be quickly emptied when chips are brought in by rail. Sulphur and lime rock can also be handled by crane or electric lift trucks.

The mill buildings are entirely of reinforced concrete of the column and lintel, beam and girder type with steel sash between exterior columns. The chip bins are also of concrete and cast as an integral part of the digester building.

With the exception of acid plant and office, all building units are combined into one large and compact mill unit.

The main equipment includes a pulp drying machine with dryers six stacks high and driven with an electric sectional drive, in fact the entire plant is 100 percent direct connected electrically. There are several features worthy of special mention, one of these being the use of enormous circular "slush stock" storage chests which are agitated by the use of recently developed hydraulic pump type agitators acting at angles of 120 degrees around the circumference.

Another feature is the use of filtered air to the high density bleachers which is introduced by blowers while exhauster fans withdraws the fumes. Provision is made for a two stage bleaching operation and for this purpose two sets of high-density bleachers and thickeners are being installed. Knotters, washers, rifflers and both centrifugal and flat screens are in combination, which should allow the manufacture of the best bleached pulp possible from the wood fiber obtainable in the Northwest. Production is expected to begin sometime in April.

PLANT OF THE RAINIER PULP & PAPER CO., AT SHELTON, WASH.

Wood Pulp Industry Becomes More Stabilized

Principal Features of Past Twelve Months Were the Record-Breaking Production and the Unusually Large Tonnage Sold at Beginning of Year—Prices on Contracts for Forward Delivery Fluctuated Slightly, and the Tendency Was Towards Purchasing Further in Advance Than for Several Years Past—Canada Led in Exportation of Wood Pulp to the United States, Closely Followed by Sweden.

Written Especially for the Annual Number of the Paper Trade Journal by O. F. Swanson, Sales Manager of Andersen & Co., and the Pulp and Paper Trading Co.

For some time past, and until quite recent years, the wood pulp business was in such a topsy-turvy condition all over the world that it could have furnished material for volumes of interesting reading, but during the last few years, and especially so in 1926, the business has become so stabilized that the condition of the wood pulp industry at present can be considered practically normal again.

At the same time, 1926 has in many respects been one of the most extraordinary years because of its record breaking production, the unusually large tonnage sold at the first of the year, the slight price fluctuation on contracts for forward deliveries and the tendency towards buying further in advance than for several years past.

The market opened well and there was every evidence of considerable strength in all grades of wood pulp, and brisk buying prevailed during the first quarter of the year. Commencing with the second quarter, there were indications of a decreasing demand, which was especially noticeable in the spot business and for summer deliveries.

This condition, however, was usually considered of minor importance, because the so-called open water shipments against contracts from Baltic ports were soon expected to commence, and the majority of the buyers had evidently not only covered their requirements, but in some cases considered themselves overstocked and, as a consequence, resales on a small scale began and continued throughout the year.

Canada and Sweden Lead in Exports

As usual Canada led in the exportation of wood pulp to the United States by shipping about 518,000 tons of chemical wood pulp, with Sweden a close second with about 500,000 tons, and Norway and Finland next. According to calculations about 80 per cent of last year's production of the large exporting European pulp mills had already been sold at the end of 1925 for deliveries during 1926, as well as a considerable part of this year's.

Never having previously obtained this high percentage in tonnage sold at the beginning of any year, and with practically the entire last year's production of well known and popular brands disposed of at the first of the year, the position of the wood pulp industry for 1926 was naturally considered very favorable, and all signs indicated a prosperous and general satisfactory year to both buyers and sellers.

The Royal and Ancient being apparently closely affiliated with the wood pulp and paper industries, ambitious, discouraged or optimistic salesmen, depending upon one's views in the matter, would sometimes refer to the situation during the first quarter of the year as follows: "Nothing to sell, nothing to do but play golf this summer," but owing to other matters requiring their attention about the time of the year that this sport is enjoyed, this prediction did not come true.

Output of Chemical Pulp Expands

Judging from the available figures on the production of chemical wood pulp in the United States, Canada, Sweden, Norway, Finland, Germany, Czecho-Slovakia and Austria, the combined tonnage produced in these countries last year exceeded the output of 1925, and in the case of Sweden alone by approximately 140,000 tons. The approximate tonnage manufactured there last year was 1,430,000 tons, of which about 120,000 tons bleached sulphite—907,000 tons unbleached sulphite and 403,000 tons sulphate or kraft pulp.

Fortunately, the Swedish mills escaped any serious labor difficulties. The United States is reported to have been Sweden's largest buyer and it is calculated that approximately 33 per cent of the year's output of sulphite, and about 75 per cent of sulphate or kraft pulp were sold here, so that as far as kraft pulp and strong unbleached sulphite is concerned, the tonnage imported from Sweden is by far the largest from any country.

Like other pulp producing countries, Norway bid fair to establish a new production record for herself, but, unfortunately, she encountered serious difficulties in the appreciation of her currency, which apparently had a very disturbing effect in the wood pulp industry. About August 15 her pulp mills were closed down owing to a disagreement between employers and employees concerning a proper or acceptable reduction in wages to both parties.

The Norweigan Paper Makers Strike

It may be recalled that the employers requested a reduction of 27 per cent while the men considered 10 per cent sufficient. Being unable to reach an agreement, it resulted in a strike of about seven weeks; the matter finally being settled by arbitration, the wage reduction fixed at 17 per cent and to remain valid for six months. Until the closing of the Norwegian mills, the production was very satisfactory, and as previously referred to, but for this strike, Norway would no doubt have had a record year.

It is doubtful that the decreased production of Norwegian wood pulp caused any inconvenience to users of this commodity in this market. On the other hand, it probably had a slight stimulating effect in the world's market which had shown signs of a gradual weakening since April.

Perhaps the general strike in England, together with the coal dispute there, more than offset the effect of the Norwegian strike. But for these unfortunate strikes, the wood pulp industry the world over might have experienced something like a "boom year."

It is estimated that Norway's production of chemical wood pulp for sale, 1926, amounted to 240,000 tons, of which 102,000 tons was bleached sulphite, 118,000 tons unbleached sulphite, and 20,000 tons sulphate or kraft pulp. About fifty per cent of the bleached sulphite, 40 per cent of the kraft pulp, as well as a fair percentage of the unbleached sulphite and ground wood were sold in the United States.

In bleached sulphite of exceptionally high quality, Norway is unquestionably the largest European exporter to the United States. She is also a very important factor in mechanical wood pulp, of which a considerable tonnage is shipped here. In spite of the strike and other difficulties, the estimated total production for 1926 was only slightly below that of 1925, but owing to the appreciation of the currency, the net pecuniary results were less satis-

factory. It is, however, only a question of time when conditions will become quite normal again.

Production in Finland

The total production of chemical wood pulp made in Finland is calculated at about 432,000 tons, constituting about 347,000 tons sulphite and 85,000 tons sulphate and kraft pulp. About 25 per cent of the total production was sold in the United States and the wood pulp business in general for 1926 was considered quite satisfactory in that country.

In addition to the tonnage referred to above, Germany, Czecho-Slovakia and Austria also shipped the United States both chemical and mechanical wood pulp. The qualities made in these countries showed signs of improvement and a few of the brands became quite popular in this market.

Although there was a gradual weakening in the world's market during the summer months and until the end of the year, together with a number of resales in this market, it is gratifying to note that the calculated decrease in the average price during that period did not exceed 5 per cent, bleached sulphite and ground wood evidently being the weakest.

Sales prices based on tons of 2,000 pounds air dry fiber, f.o.b. shipping points American and Canadian pulp mills, and ex-dock usual Atlantic ports on imported pulp were reported at the beginning and end of the year as follows, the variation in some depending on quality:

Mechanical Pulp

	Quotations for Jan. 7, 1926	Quotations for Dec. 30, 1926
No. 1 Imported—		
Moist	35.00 @ 40.00	36.00 @ 38.00
Dry	38.00 @ 42.00	38.00 @ 40.00
No. 1 Domestic	28.00 @ 32.00	30.00 @ 32.00
Screenings		15.00 @ 20.00

Chemical Pulp

Sulphite (Imported)—		
Bleached	4.25 @ 4.50	3.75 @ 4.50
Easy Bleaching	3.55 @ 3.60	3.20 @ 3.35
No. 1 strong unbleached	3.15 @ 3.35	2.95 @ 3.05
No. 2 strong unbleached	2.90 @ 3.10	2.85 @ 2.90
Mitscherlich unbleached		3.00 @ 3.40
No. 1 Kraft	3.25 @ 3.40	2.90 @ 3.05
Sulphate—		
Bleached	3.75 @ 4.00	3.75 @ 4.00
Sulphite (Domestic)—		
Bleached	4.00 @ 4.75	3.65 @ 4.75
Easy Bleaching Sulphite	3.00 @ 3.25	3.00 @ 3.25
News Sulphite	2.90 @ 3.00	2.65 @ 2.85
Mitscherlich	3.25 @ 3.75	3.25 @ 3.75
Kraft (Domestic)	3.00 @ 3.50	3.00 @ 3.50
Soda Bleached	4.00 @ 4.25	3.75 @ 4.00

Growth of Wood Pulp Industry

About sixty years ago, an American chemist, B. D. Tilghman, discovered a process for manufacturing chemical wood pulp by cooking wood with a solution of calcium of bi-sulphite or other bases, and was granted a United States patent on his process in 1867. Like most inventors he undoubtedly had optimistic views regarding the value of his discovery, and assuming that he was also the happy possessor of the most vivid imagination, even then it does not seem possible that he expected the annual production of this commodity sixty years later to reach millions of tons. It is reported that he was experimenting with fats and found when using sulphuric acid (SO_3) that the solution attacked the wooden vessels containing the mixture, indicating that this valuable discovery, like many others, was accidental.

From its very beginning the wood pulp industry has been the subject of phenomenal growth, but particularly so since the improvement in the quality of the higher grades of sulphite reached the point where the same could substitute certain grades of rag stock. It is an interesting fact that chemical wood pulp is today more extensively used in writing papers and similar qualities than ever before, and it is calculated that about 65 per cent of the total production in the United States of this type of papers is now manufactured exclusively of this important raw material for paper making.

In the so-called rag contents grades of writing papers, chemical wood pulp of exceptionally high quality constitutes one of the main ingredients, but the tonnage of such papers have not participated to the same extent in the normal growth of the paper industry that the so-called 100 per cent wood papers have. Occasionally the text of this article might wander away somewhat from the subject but, if so, it has only been done for the purpose of making the position of wood pulp clearer.

Development of Alpha Pulp

Of recent developments in the wood pulp industry, Alpha pulp unquestionably occupies the most important position, as in this grade another quite satisfactory substitute for some grades of rag stock has evidently been found, and for certain grades of paper, this pulp has actually improved the quality of same. Artificial silk—Rayon, Viscose and Celanese—is now being manufactured on a large scale, not only in Europe, but on this continent and it is reasonable to assume that this will have a tendency to gradually strengthen the position of wood pulp, because in the first place the artificial silk industry will no doubt require a larger amount of chemical wood pulp in the future than at the present time, and in the second place the rag stock of artificial silk is so far considered of very little, if any value, as a raw material for paper making. For these reasons the demand for Alpha and other chemical pulp should increase to a certain extent in the same proportion that the decrease of softer rag stock occurs.

Artificial Silk Industry

In addition to the artificial silk industry, there are kindred industries using wood pulp indirectly, of which no doubt the most important are the automobile and radio industries. It is perhaps not generally known to owners of automobiles that some parts of the automobile bodies consist of material containing a predominating percentage of wood pulp, and when the—usually enthusiastic—owners of radios indulge in their favorite pastime, sometimes until the wee hours of the morning at tuning in by turning and adjusting the various implements or dials on their pets, they are, as a rule, not acquainted with the fact that certain parts of the same also contain wood pulp in one shape or another. Wood pulp is also used for other purposes.

CAREW MFG. CO., SOUTH HADLEY FALLS, IN 1848

Paper makers, as will be seen from the picture, in these days had less reason to be concerned about the flimsy fabric and abbreviated length of female apparel, which, authorities say, is among the principal causes at present for the decreasing supply of rags for paper making purposes.

Paper Stock Business Has An Unsettled Year

Hand to Mouth Buying the Rule Largely Throughout the Year Resulting in Stock Accumulations and Price Sacrifices—Rags for the Most Part Reached Lower Price Levels Than in 1925—Demand for Sulphite Bond Reacted on Rag Content Papers With Result That High Grade Writings Did Not Find a Ready Market Producing Little Demand for Better Grades of New and Old Rags and Depressing Prices.

Written Especially for the Annual Review Number of the Paper Trade Journal by Walter R. Hicks of Daniel M. Hicks, Inc.

And again the door hath closed upon another year. It hath slammed in the faces of some, banged the fingers of others and jarred all. The paper stock business is a going business. It is going fast. Effort should be crowned by success, but in some cases it has been crowned by the sheriff. We were all kept busy, working early and late, contributing the best there was in us, but to some that was all it was, a contribution. We all believe in the spirit of live and let live. The spirit has been upheld but the practice withheld.

Big Volume But No Profit

We are told business was good last year. While the volume was there, there was no profit. And without profit, business in the real sense was not good. Car loading reached new high levels, but many of these cars were loaded at a loss. Cotton, tobacco and farm products were among those that helped to swell the cars to bursting point, and the shippers to busting point. There was another commodity in this class that the world knew little about, and that was paper stock. This was due largely to lack of organization and cooperation. And so it will be in 1927, 1928, and for all time.

Hand To Mouth Buying

1926 was a year of set ups and up sets. The mills would do a little buying, and just as things began to look bright they would drop out of the market and the horizon would cloud up again. The trade suffered from the hand to mouth disease. The mills considered this procedure healthy, but it was fatal to the packer, as it meant accumulating stocks and price sacrifices. Does the supply exceed the demand? is the query asked by many.

Board, book, fiber and roofing mills have been operating to capacity, resulting in over production and keeping the market on finished materials at low levels. These mills represent the tonnage, and this condition was reflected in the prices of rags and waste paper. The specialty mills were the only group that enjoyed good business, and while they may have been able to pay higher prices for raw material, they were not compelled to, because of the depression.

A Weird Spectacle

And so, 1926 was sure a tussle. It can best be portrayed in what we might term the "Paper Hangers' Pageant." It presents a weird spectacle with wood pulp symbolizing Victory, with colors flying, having survived the strife, and carrying the honors of the year. The next float bears the title Perseverance, and depicts waste paper, toiling along a rough road, battle stained and grimy, but still in the struggle. Bringing up the rear is the ambulance train, bearing the name Rags, representing the dead, the wounded, and the missing.

Better Grades of Waste Paper Steady

Wood pulp enjoyed the distinction of leading all the other raw materials that enter into the manufacture of paper, holding firm for the major portion of the year. With it, and largely because of it, the better grades of waste paper remained steady, while the lower grades were more or less unsettled, varying with the fluctuating demand. Kraft paper showed the biggest advance of any of the old papers, going from a low of $1.60 to $2.50 f.o.b., New York. Mixed papers, news, and all grades of manilas, were quiet for the most part, with occasional flurries.

Rags, the Greatest Problem

Rags presented the greatest problem of all the grades of paper stock. For the most part they reached lower levels than in 1925. The dullness is attributed to many causes, but whatever they may have been, the demand was not there. The drop in roofing rags is said to be the result of curtailment in building operations. The fine paper mills at no time were running to capacity, as the demand for sulphite bond reacted on rag content papers, with the result that high grade writings did not find a ready market. There was consequently little buying of the better grades of new and old rags, which resulted in lower prices as the year progressed.

A Substitue for Rags

A substitute for rags was launched on the market and while it has been tried by some mills, it is still in the experimental stages, and its success not fully known. It, however, had a bearish tendency on rags, and further depressed the market.

Will Eventually Readjust Itself

The situation as regards rags will eventually readjust itself, as ever changing conditions will bring about new demands which will again put rags in the running and assure packers of a steady outlet. One large factor is the ever increasing consumption of wiping rags, which already takes a large tonnage of whites and thirds and blues out of the market that formerly went for paper making.

Some impetus was given the situation when the New York Times made it known that it was going to use a 100 per cent rag paper for its library and record file issues. In all probability, other enterprising publications will adopt the same practice. With the public becoming educated in the durability of rag papers, it is felt that its use will be greatly increased where permanency is a factor.

Are we at the beginning of the rainbow? Are we entering upon a new cycle in the evolution of rags? The evolution of rags has been described as follows: "Rags make Paper; Paper makes Money; Money makes Banks; Banks make Loans; Loans make Poverty, and Poverty makes Rags."

U. S. GYPSUM CO. ADDS ANOTHER MILL

The new paper mill for the U. S. Gypsum Company at Kansas City, Mo., is being rushed to completion under the personal direction of S. T. Johnson, paper mill supervisor, who recently had charge of construction of the eighty ton mill which this company built at Oakfield, N. Y. The paper machine will be furnished by the Black-Clawson Company of Hamilton, Ohio. The stock will be prepared in the same type of beating equipment as used at Oakfield, N. Y., manufactured by the Dilts Machine Works, Inc., of Fulton, N. Y., and are of their latest New Type design.

Paper Making Chemical Steadier During 1926

Although Keen Competition Was Experienced, the Market Exhibited a Stable and Generally Firm Tone Throughout Past Twelve Months—Consumption of Many of the Important Paper Making Chemicals Was Greater Than in Preceding Year—Market Absorbed Production Freely and There Were No Undue Accumulations of Stocks—Contract Withdrawals Were Well Maintained—Outlook Is Good.

Written Especially for the Annual Number of the Paper Trade Journal by Guy A. Gardner, Mgr., Chemical Div., M. Gottesman & Co., Inc.

Industrial chemicals, particularly those used in large quantities by the paper and pulp manufacturers, were in unusually good demand during practically the entire past twelve months; in fact the consumption of many of the important paper making chemicals was greater in 1926 than during the preceding year, although 1925 was generally regarded as an exceptionally good year. Production, which had been considerably increased in 1925, was kept at high water mark during the entire period in most of the leading items, but the market seemed able to absorb it and very few accumulations of stock were reported. This, of course, did away with the necessity of forcing sales, and prices were firmly maintained.

Contract shipments of salt cake (sodium sulphate), bleaching powder, chlorine, sulphate of alumina, and sulphur, were well maintained throughout the year, even during the summer months withdrawals continued at an excellent rate.

There were very few price changes of importance, the market showing a stable and generally firm tone, even though competition was keen at times in some items. During the spring and early summer, spot demand improved, especially in the various soda products, and the prices of tonnage for prompt shipment became very firm, in some cases registering an advance.

The chemical market, as a whole, closed the year 1926 in a strong position. Contracts for 1927 were booked in very satisfactory volume and practically at the price levels prevailing for 1926, which may be taken as indicating few disturbing factors in the market, and a favorable outlook for continued good business during the coming year.

The exceptionally heavy demand from the glass manufacturers and pulp manufacturers for salt cake kept the manufacturers busy and at one time caused an actual shortage of spot supplies. All the plants are sold well ahead, and the outlook is for continued good business at prevailing prices which held during 1926.

With an increased demand and lessened production during the last few years, salt cake, which in the past has been considered a by-product, threatens to become a main item. There can be little doubt that its value will increase during the coming years, as the production of synthetic nitrogen becomes more general, thus eliminating the production of nitre cake which heretofore has been depended on as a means of enlarging the supply of by-product salt cake.

An increasing demand for papermakers alum and filter alum kept production of sulphate of alumina close to plant capacity during 1926. In the spring and early summer months the call for water filtering alum was unusually heavy. The tonnage produced and consumed during the past year was very nearly a record. The advance in the price of sulphuric acid greatly strengthened the market position and the western contract price for 1927 was advanced several dollars per ton. The contract price from eastern works was firmly held at $1.40 per 100 pounds for papermakers alum in bags and this price was also made effective for contract deliveries over 1927.

The production of the iron free quality was also increased, most manufacturers reporting very good business during the year.

The consumption of sulphur was considerably larger during 1926 than during previous years and domestic production was lessened by the exhaustion of several large mines in the Louisiana territory, which heretofore had supplied a considerable portion of the demand. This condition resulted in an increase in price of several dollars a ton and from all indications it would seem that still higher prices may be looked for in the near future. The increase in production of sulphuric acid has called for larger shipments of sulphur, and the sulphite pulp manufacturers are also increasing their demands on the sulphur producers. Constant search is being made for new producing fields and perhaps some profitable mines will be located, but there can be no doubt that at present the demand for sulphur is in excess of production. This is shown by the fact that the importation of Sicilian sulphur during the year was increased, and the greater demand for pyrities which has developed in the last few months.

The manufacturers of chlorine enjoyed a steady demand for their product during the year and there were apparently no surplus stocks to upset the market, a condition which frequently prevailed in former years. The continued increase in the use of chlorine by the pulp and paper manufacturers has played a large part in stabilizing the production and consumption of liquid chlorine. Prices were firm during the year at 4 cents per pound, f.o.b. works, in tank cars, with the usual advance for drums and cylinders. This price was also made effective for contract shipment over 1927.

Bleaching powder was in good demand and production was so closely kept in line with consumption that there were no accumulation of stocks during the year. The price for contract shipment was held at 2 cents per pound, f.o.b. works, in standard sized drums, and the same price is quoted for 1927 contract delivery.

Prices were somewhat higher than in 1925, due to a drop in domestic production, which resulted in an advance in price, although the import record shows a substantial increase in tonnage received from abroad. The market is firm and present advices from the Argentines indicate that it is unlikely there will be any softening in prices for some time.

Shipments against contracts moved steadily during the year and the tonnage exported was about 15 per cent greater than in 1925. Due to economies made possible by increased production, manufacturers reduced the contract price for 1927 about $2 a ton on caustic soda and $1 a ton on soda ash. Caustic soda is now quoted at $3 per 100 pounds, f.o.b. works, in large drums, for contract shipment, and soda ash at $1.32½ per 100 pounds, f.o.b. works, in bags.

Compared with the previous twelve months, the prices on china clay, both imported and domestic, were slightly lower, although during the strike of coal miners in Great Britain, deliveries of English clay were greatly interfered with, and higher prices were asked for spot tonnage. Increased freight rates and scarcity of spot supplies resulted in somewhat higher prices for a time. The market is firm, and indications point to a good business.

Paper and Wood Pulp Production in 1925

Biennial Census of Manufactures Taken in 1926 Shows Value of Paper and Wood Pulp Production for 1925 Was $971,882,320, an Increase of Over Seven Per Cent Over 1923 When the Valuation Was $907,346,992—Total Output of Paper in 1925 Was 9,182,204 Tons Valued at $862,588,916, an Increase of Over Fourteen Per Cent in Quantity and Six Per Cent in Value Over 1923 — Census Figures In Detail.

Prepared by the Department of Commerce, Washington, D. C.

The Department of Commerce announces that, according to data collected at the biennial census of manufactures taken in 1926, the establishments engaged primarily in the manufacture of paper and wood pulp reported, for 1925, products valued at $971,882,320, an increase of 7.1 per cent as compared with $907,346,992 for 1923, the last preceding census year. Of the 763 establishments engaged in the industry, 537 reported the manufacture of paper only, to the value of $529,041,024; 38, wood pulp only, $17,833,003; and 188 both paper and wood pulp, $425,008,293.

Total Output of Paper

The total output of paper of all classes (including paper boards) in 1925 was 9,182,204 tons, valued at $862,588,916, an increase of 14.4 per cent in quantity and 6.2 per cent in value as compared with 8,029,482 tons, valued at $812,509,171, in 1923. The quantities and values of the principal classes of paper covered by the total for 1925 were as follows: Paper boards (chip board, test liner board, straw board, news board, etc.), 3,280,710 tons, valued at $192,627,874; book paper, 1,343,310 tons, valued at $177,291,847; wrapping paper, 1,297,919 tons, valued at $143,901,136; news print, in rolls and sheets, 1,563,318 tons, valued at $106,083,161; fine paper, 473,804 tons, valued at $105,474,234; and tissue paper, 281,243 tons, valued at $45,734,920.

Location of the Mills

Of the 763 establishments reporting for 1925, 156 were located in New York, 84 in Massachusetts, 59 in Pennsylvania, 57 in Wisconsin 53 in Ohio, 42 in Michigan, 39 in New Jersey, 38 in Maine, 35 in Connecticut, 29 in Illinois, 25 in Indiana, and 25 in New Hampshire, 17 in Vermont, and the remaining 104 in 21 other states.

The statistics for 1925, as presented herewith, are preliminary and subject to such correction as may be found necessary upon further examination of the returns.

TABLE 1

SUMMARY FOR THE INDUSTRY: 1925 AND 1923

	1925	1923	Per cent of increase or decrease(—)
Number of establishments	763	746	2.3
Wage earners (average number) (a)	123,862	120,677	2.6
Maximum month	Mar. 125,849	May 123,759	..
Minimum month	Aug. 122,075	Jan. 118,500	..
Per cent of maximum	97.0	95.8	..
Wages (b)	$160,174,932	$151,476,693	5.7
Cost of materials (including fuel and mill supplies) (b)	$606,025,286	$573,727,153	5.6
Products, total value (b)	$971,882,320	$907,340,992	7.1
Paper boards	$192,627,874	$182,867,070	5.3
Book paper	$177,291,847	$169,285,720	4.7
Wrapping paper	$143,901,136	$141,532,423	1.7
News print, in rolls and sheets	$106,083,161	$110,864,736	—4.3
Fine paper	$105,474,234	$89,098,027	18.4
Tissue paper	$45,734,920	$44,144,313	3.6
All other paper	$91,475,744	$74,716,882	22.4
Wood pulp (not including that made and consumed in the same plant)	$55,200,140	$65,497,098	—15.7
All other products	$54,093,264	$29,340,723	84.4
Value added by manufacture (c)	$365,857,034	$333,619,839	9.7
Horsepower	2,427,010	2,178,623	11.4

(a) Not including salaried employees.
(b) The amount of manufacturers' profits can not be calculated from the census figures, for the reason that no data are collected in regard to a number of items of expense, such as interest on investment, depreciation, taxes, insurance, and advertising.
(c) Value of products less cost of materials.

TABLE 2

PRODUCTS, BY CLASS, QUANTITY, AND VALUE, FOR THE UNITED STATES: 1925 AND 1923

(Ton, 2,000 pounds)

Class	1925	1923
Total value, all products	$971,882,320	$907,346,992
Paper Mill Products		
Paper and paper boards, total:		
Tons	9,182,204	8,029,482
Value	$863,588,916	$812,509,171
Standard news print, in rolls and sheets—		
Tons	1,563,318	1,521,080
Value	$106,083,161	$110,864,736
Hanging papers—		
Tons	104,554	110,842
Value	$9,506,383	$10,284,723
Poster, novel, tablet, lining, etc.—		
Tons	83,959	55,429
Value	$7,096,374	$4,959,599
Book Paper, total—		
Tons	1,343,310	1,207,927
Value	$177,291,847	$169,285,720
Machine finished—		
Tons	852,018	780,262
Value	$107,147,061	$107,078,573
Sized and supercalendered—		
Tons	295,255	268,939
Value	$36,407,832	$34,482,245
Coated—		
Tons	180,462	158,726
Value	$31,970,357	$27,724,902
Plate, lithograph, map, woodcut, etc.—		
Tons	15,575	(1)
Value	$1,766,597	(1)
Cover paper—		
Tons	24,285	20,681
Value	$5,806,029	$4,972,643
Fine paper, total—		
Tons	473,804	377,029
Value	$105,474,234	$89,098,027
One hundred per cent rag—		
Tons	17,513	
Value	$10,140,496	
Less than 100% to 50% rag—		
Tons	43,836	
Value	$17,967,967	
Less than 50% rag—		(2)
Tons	70,847	
Value	$19,620,119	
Chemical wood papers (including sulphite bond)		
Tons	341,608	
Value	$57,745,652	
Wrapping (or coarse) paper, total—		
Tons	1,297,919	1,184,234
Value	$143,901,136	$141,532,423
Bag—		
Tons	123,705	123,577
Value	$14,617,053	$16,579,539
Bleached Fiber—		
Tons	34,407	(1)
Value	$5,082,393	(1)
Bogus and screenings—		
Tons	77,484	
Value	$5,706,759	
Wood manila—		146,038
Tons	38,583	$13,917,661
Value	$3,308,741	
Fiber—		
Tons	93,051	(1)
Value	$8,333,534	(1)
Grease-proof and glassine—		
Tons	47,642	(1)
Value	$9,198,620	(1)
Heavy (mill wrappers, etc.)—		
Tons	58,725	92,909
Value	$3,930,384	$7,901,914
Kraft—		
Tons	479,975	381,710
Value	$51,113,624	$46,277,910
Manila (rope, jute, etc.—)		
Tons	84,279	95,821
Value	$13,143,778	$15,991,515
Tag board, light manila board, and pattern—		
Tons	21,241	(4) 33,678
Value	$3,004,336	$4,189,821
Vegetable and other imitation parchment—		
Tons	8,111	(1)
Value	$2,218,121	(1)

Class	1925	1923
All other—		
Tons	230,716	(8) 310,501
Value	$24,243,793	$36,674,063
Boards, total—		
Tons	3,280,710	2,792,832
Value	$192,627,874	$182,867,070
Wood pulpboard (exclusive of wall board)—		
Tons	130,881	200,203
Value	$8,752,463	$13,840,668
Wall board—		
Tons	50,759	(6)
Value	$4,099,426	(6)
Strawboard—		
Tons	332,403	272,390
Value	$15,940,656	$13,987,577
Newsboard—		
Tons	253,460	196,830
Value	$12,009,817	$11,646,550
Test liner board—		
Tons	487,475	(6)
Value	$28,081,633	(6)
Binders' board—		
Tons	38,804	
Value	$2,948,056	
Fress board—		(7) 50,669
Tons	6,991	$5,361,860
Value	$1,237,416	
Cardboard—		
Tons	72,280	
Value	$7,172,930	
Bristol board—		
Tons	44,193	
Value	$6,677,814	
Card middles—		(7) 234,220
Tons	9,770	$20,429,205
Value	$858,836	
Ticket board—		
Tons	9,615	
Value	$817,924	
Leather board—		
Tons	14,269	16,906
Value	$1,717,754	$1,342,219
Chip board—		
Tons	951,570	928,149
Value	$44,488,965	$52,333,210
All other—		
Tons	878,240	893,465
Value	$57,824,184	$63,925,781
Tissue paper, total—		
Tons	281,243	250,616
Value	$45,734,920	$44,144,313
Hide grade—		
Tons	49,818	34,679
Value	$10,934,837	$9,714,706
Waxing—		
Tons	44,499	(8) 73,341
Value	$6,942,062	$13,153,586
Manila and No. 2 white—		
Tons	37,359	31,036
Value	$4,671,816	$4,622,979
Towel—		
Tons	28,741	
Value	$3,815,549	33,301
Napkin—		$4,519,311
Tons	11,979	
Value	$2,240,954	
Toilet—		
Tons	108,847	78,259
Value	$17,129,702	$12,133,731
Absorbent paper, total—		
Tons	51,126	15,798
Value	$9,999,928	$3,776,522
Blotting—		
Tons	12,948	15,798
Value	$2,585,368	$3,776,522
Filter—		
Tons	1,221	(9)
Value	$176,207	(9)
Matrix—		
Tons	2,153	(9)
Value	$464,921	(9)
For vulcanized fiber—		
Tons	17,148	(9)
Value	$3,402,589	(9)
For parchmentizing—		
Tons	17,656	(9)
Value	$3,370,843	(9)
Building paper, total—		
Tons	555,231	(10) 344,695
Value	$44,030,789	$23,528,831
Building and sheathing—		
Tons	101,394	(11)
Value	$7,256,529	(11)
Felts and roofing—		
Tons	453,837	(11)
Value	$36,774,260	(11)
Asbestos filled—		
Tons	27,169	(11)
Value	$1,661,089	(11)
All other paper—		
Tons	95,576	(8) 148,397
Value	$13,375,152	$27,194,564
Manufactures of paper (12)	$44,419,909	$24,940,391
Pulp-Mill Products		
Wood pulp, total production, tons (13)	3,953,381	3,789,172
For sale (14)—		
Tons	912,687	1,063,398
Value	$55,200,140	$65,497,098
Ground, steamed, total production, tons (13)	69,174	103,713
For sale (14)—		
Tons	6,789	7,301
Value	$269,828	$235,050
Ground, not steamed, total production, tons (13)	1,534,088	1,464,081
For sale (14)—		
Tons	244,468	311,176
Value	$9,037,010	$11,167,012
Soda fiber, total production, tons (13)	484,546	445,162
For sale (14)—		
Tons	171,694	178,160
Value	$12,416,462	$14,098,270
Sulphite fiber, bleached, total production, tons (13)	610,556	557,846
For sale (14)—		
Tons	255,351	215,819
Value	$21,094,291	$19,283,046
Sulphite fiber, unbleached, total production, tons (13)	780,651	853,381
For sale (14)—		
Tons	124,376	187,245
Value	$6,923,778	$11,601,969
Sulphate fiber, total production, tons (13)	409,668	312,483
For sale (14)—		
Tons	94,659	145,051
Value	$5,076,611	$8,732,030
Screenings, mechanical, total production, tons (13)	17,671	12,759
For sale (14)—		
Tons	2,105	1,746
Value	$21,050	$28,309
Screenings, chemical, total production, tons (13)	47,027	39,747
For sale (14)—		
Tons	23,245	16,900
Value	$361,110	$351,412
Miscellaneous Paper Mill and Pulp Mill Products		
Total value	(15) $9,673,355	(16) $4,400,332

(1) Included in "All other paper" to avoid disclosing operations of individual establishments.
(2) No comparable data. Reported as "ledger and highest grade," "pole rdied," "air dried," "machine dried," "sulphite bond," and "all other."
(3) Included in "Wrapping (or coarse) paper—all other," and "All other paper."
(4) Reported as "tag stock (rope, jute, and sulphite)."
(5) Not strictly comparable with 1925. (See footnote 3.)
(6) Included in "All other boards."
(7) Not strictly comparable with 1925.
(8) Reported as "white, colored, and waxing paper."
(9) Included in "All other paper."
(10) Not strictly comparable with 1925. Reported as "building, roofing, asbestos, and sheathing paper." This item does not include data for the following products made by establishments now classified in the paper and wood pulp industry but classified at the census for 1923 in the roofing materials industry: Roofing felt, 38,357 tons, valued at $2,329,024; asbestos paper, $807,349; sheathing paper, $40,410. (No data as to quantities of asbestos paper and sheathing paper.)
(11) Not reported separately.
(12) Paper bags and paper boxes made in paper mills. Paper bags and boxes are made principally from purchased paper and purchased box board, by establishments classified for census purposes in other industries. The total output of these products is, therefore, considerably greater than that reported by paper mills alone.
(13) Includes wood pulp consumed in mills in which manufactured.
(14) Includes wood pulp transferred to other plants operated by same companies.
(15) Cellucotton, insulite, corrugated and fiber specialties, cottonseed hull shavings pulp, wood flour and fiber, and other miscellaneous products.
(16) Cellucotton, insulite, corrugated and fiber specialties, pulp cores and pipe, wood flour, and other miscellaneous products.

NEWS PRINT PRODUCTION FOR JANUARY

Production of news print in Canada during January, 1927, amounted to 161,724 tons and shipments to 158,866 tons, according to the News Print Service Bureau. Production in the United States was 135,755 tons and shipments 131,333 tons, making a total United States and Canadian news print production of 297,479 tons and shipments of 290,199 tons. During January 17,506 tons of news print was made in Newfoundland and 1,112 tons in Mexico, so that the total North American production for the month amounted to 316,097.

The Canadian mills produced 22,036 tons more in January, 1927, than in 1926, which was an increase of 16 per cent. The United States output was 4,248 tons or 3 per cent less than in January, 1926, that in Newfoundland 3,644 tons or 26 per cent more, and in Mexico 177 tons or 19 per cent more, making a total increase of 21,609 tons or 7 per cent over January, 1926.

During January the Canadian mills operated at 88.9 per cent of rated capacity and the United States mills at 88.6 per cent. Stocks of news print paper at Canadian mills totaled 17,255 tons at the end of January and at United States mills 15,968 tons, making a combined total of 33,223 tons which was equivalent to 2.5 days' average production.

Canada Takes Leading Position in News Print

Quebec Has Taken Important Part in The Expansion of The Industry, of the Seventeen Machines That Were Placed in Operation During 1926 No Fewer Than Thirteen Being Installed in That Province —Tendency Toward Consolidation With Time Apparently Rapidly Approaching When News Print Will Be Almost Entirely in Control of Three or Four Large Organizations—Active Year in Prospect.

Written Especially for the Annual Number of the Paper Trade Journal by C. L. Sibley.

The Province of Quebec has taken a leading part in the past year in the expansion of the pulp and paper industry, which in that period has not only confirmed its position as the foremost of Canada's manufacturing industries, but by surpassing the output in the United States, has placed the Dominion in the front rank as the world's leading news print producer. The capital invested in the industry in Canada is now some $500,000,000. It has added over $100,000,000 yearly to Canada's favorable balance of trade, it brings enormous revenues to the provincial governments, and it pays out $200,000,000 a year to workers, merchants, makers of equipment, governments and investors. There are over 100 pulp and paper mills, located in six of the nine provinces of the Dominion, but mostly, of course, in the provinces of Quebec and Ontario. The news print production for 1926 was around 1,875,000 tons, an increase of 350,000 tons over the total for 1925. The rated capacity of the Dominion's news print mills for 1926 was 5,700 tons per day, and the present year started with a rated daily capacity of 7,350 tons.

Of the 17 new news print machines which were put into operation during 1926, no fewer than 13 were installed in Quebec, one in Ontario, two in British Columbia, and one in Manitoba—the latter being the first news print mill to be established in the prairie Provinces, in the Manitoba Pulp and Paper Company's plant at Pine Falls, Man. Many new mills and extensions are now under construction or planned, and it is estimated that these will add 450,000 tons to the annual production during the present year, bringing the annual production to around 2,300,000 tons. In view of these developments, the fear is widely expressed that there will be some oper-production before the year is out.

During the year the market for this inucreasing production has kept pace with the output, and most of the mills have therefore been working at or near capacity. "The Market," as far as this industry is concerned, means, of course, the United States, which has taken 94 per cent. of the exports of news print. At the same time there have been increased shipments to other countries, Australia taking 30,000 tons, as compared with 2,936 tons in the previous year, and the West Indies, South Africa, South America, and New Zealand, 95,000 tons, as compared with 65,000 tons.

The expansion of the news print industry has, of course, meant an expansion in the production of wood pulp, and there has also been an increase in the export of unmanufactured wood pulp of about 50,000 tons, bringing the total exports close upon 1,000,000 tons for the year. The market for sulphite pulp has shown notable improvement, due in large part to the demands for the manufacture of rayon, about 50 per cent. the world's demands of the wood pulp for which is now supplied from Canada.

Expansions During the Year

Among the more important developments during the year were the following:

Port Alfred pulp and paper Corporation put into operation a new news print mill of 400 tons daily capacity.

Canadian International Paper Company at Three Rivers added four machines, doubling its capacity, which is 700 tons per day.

St. Maurice Valley Corporation added two 100-ton news print machines at Shawinigan Falls.

St. Lawrence Paper Mills Ltd., Three Rivers, added two 80-ton news print machines, bringing the total capacity to 325 tons per day.

Brompton Pulp and Paper Company, Bromptonville, added one 125-ton machine.

Canada Paper Company, Windsor Mills, added new chemical pulp equipment.

St. Anne Paper Mills Ltd. have a new mill under construction at Beaupre, with a daily capacity of 250 tons of news print.

Canadian International Paper Company are constructing a new 500-ton news print mill at East Templeton.

Anglo-Canadian Pulp and Paper Mills Ltd. are constructing a 400-ton news print mill at Limoilou.

St. Regis Paper Company is beginning the construction of a new $10,000,000 mill near Quebec in the early spring.

The Lake St. John (formerly Mistassini) Power and Paper Company is building a new mill in the Lake St. John District.

Price Bros. & Company are adding two machines to their mill at Riverbend, to bring the total capacity to 925 tons daily.

Spruce Falls Power and Paper Company is building a new town and a news print mill at Kapuskasing.

Thunder Bay Company is building a new mill at Port Arthur.

Provincial Paper Mills Ltd. have installed a new machine for book paper.

Fort William Paper Company made extensive additions.

Kenora Paper Mills Ltd. added a new machine of 125 tons daily capacity.

Canadian Cellulose Co., is building a new mill at Cornwall.

Manitoba Pulp and Paper Company have established a new mill at Pine Falls.

Powell River Company made extensive additions to its plant in British Columbia, including the addition of two new machines.

New mills were also established by the Canadian Scottish Paper Co., and the Sydney Roofing and Paper Company.

In New Brunswick development work was commenced on the Grand Falls preparatory to the building of new mills by the Fraser Companies and the Canadian International Paper Company, with a total capacity of 250 tons of news print each per day.

The Ontario Paper Company is developing 40,000 h. p. on the Outarde river, Que., and will follow this with the erection of a 100-ton pulp mill.

The Bathhurst Company, of Bathhurst, N. B., is building a new news print mill with two machines of 200 tons capacity.

The Straw Paper Company, Ltd., of Canada, is floating an issue of $300,000 for the purpose of constructing a plant at Edmonton, Alta., for the manufacture of paper from straw.

The Rayon Industry

Canada is moving forward rapidly in the rayon industry. The Kipawa mill of the International Paper Company at Temiskaming, Que., is now devoted entirely to the manufacture of sulphite pulp

to be used in the manufacture of rayon, and the rayon itself is being manufactured here in increasing quantities. For example, Courtlands, Limited, the largest manufacturers of the product in the United Kingdom, have a $2,500,000 plant at Cornwall, Ont. The Celanese, Limited, a $7,000,000 concern, is constructing a large plant at Drummondville, Que. The Howard Smith Paper Mills have formed a subsidiary company called the Canadian Cellulose Company to be operated in Cornwall, Ont., and the British Columbia Pulp and Paper Company is carrying on chemical research into the use of hemlock for rayon manufacture, with good results to date. Other concerns are reported to be making preliminary moves towards establishing plants.

Book and Wrapping Paper

In regard to book, wrapping, and other grades of paper outside of news print, there has not been the great increase of activity shown by the news print mills, but conditions were appreciably better than in the previous year. The principal outlet for these grades of paper is found in the domestic market, which of course does not give the tremendous possibilities that the American market offers to news print. In practically every grade, however, production increased and business generally was satisfactory. Exports, principaly to the countries within the British Empire, amounted to about 40,000 cwts.

Movement Towards Consolidation

The past year was one of mergers and rumors of mergers. There can be no doubt that, at any rate as regards the news print industry, the tendency is towards consolidation, and the time appears to be rapidly approaching when this industry will be almost entirely in the control of three or four large organizations.

The formation of the St. Maurice Valley Corporation was one of the most important moves in this direction. This corporation has acquired control of the St. Maurice Paper Company, the Belgo-Canadian Paper Company, and the Canada Paper Company. The corporation has also joined with the Port Alfred Pulp and Paper Corporation and the Wayagamack Pulp and Paper Corporation in a new company known as the Anticosti Company for taking over the island of Anticosti, and utilizing the pulpwood resources there, estimated at 15,000,000 cords. Another large company of dominating importance in the news print situation in Canada is the International Paper Company, which is expanding and absorbing at a great rate. Only recently Premier Taschereau stated that this company has uncompleted works, or works under construction in the province of Quebec, representing $111,000,000. In Ontario the Spanish River interests are looming large, while during the year the Abitibi Power and Paper Company has absorbed the Mattagami Pulp and Paper Company, of Smooth Rock Falls.

In New Brunswick the International Paper Company and the Fraser Companies, Limited, are dominant, and are working in close harmony. These two companies are associated in the great hydro-electric development at Grand Falls, N. B., which, with associated pulp and paper mills, will involve expenditures of between $25,000,000 and $40,000,000.

Water Power Progress in 1926

Allied with the pulp and paper industry is, of course, the development of water powers, and in this Canada made notable progress during the year. A total of 266,000 hp. was added during the year, bringing hydro-electric installation in the Dominion up to 4,556,000 hp. The new installations represent a direct investment of at least $25,000,000 without regard to new capital required in the application of the power. Projects are now under way which will ultimately add 1,700,000 to the total development, while three plants comprising a single enterprise will have a capacity double that o fthe entire installation during 1926. Of these three plants two are nearly completed. In addition to the projects actually under construction others involving a further installation of 1,000,000 hp. are in active prospect. A direct investment, therefore, of $270,000,000 at least may be expected in Canada's hydro industry during the next few years, with a further and much larger investment in industries and equipment for the distribution and utilization of this new supply of power.

Developments in Quebec

In Quebec 168,000 hp. was installed, 90,000 of which was at the head of the Saguenay river, where the Duke-Price development now amounts to 450,000 hp., the ultimate capacity being 540,000. Of the remaining installations two may be mentioned: the replacement of a 1,600 horse-power development by one of 22,200 horse-power on the Batiscan river by the Shawinigan interests and a 16,800 horse-power addition at the Kipawa plant of the Canadian International Paper Company. The latter company is also responsible, through its subsidiary the Gatineau Power Company, for the greatest hydro-electric construction work during the year. Two plants on the Gatineau river, one at Chelsea of 170,000 horse-power and one at Farmer's rapids of 120,000 horse-power were nearly completed by this company, while a third at Paugan Falls of 240,000 horse-power was begun. Progress was also made on another and larger development, that of the Aluminum Company of Canada at Chute-a-Caron on the Saguenay river where a development of 800,000 horse-power ultimate capacity is in course of construction. This company is already operating its reduction works at the new town of Arvida with power from Ile Maligne. The Ontario Paper Company commenced the construction of a 40,000 horse-power station on the Outardes river, on the north shore of the St. Lawrence.

The Quebec Streams Commission continued its valuable work in connection with construction and operation of storage reservoirs in the interest of power development, and is at present directing the construction of the Baskatong reservoir on the Gatineau river which is being carried on by the Canadian International Paper Company.

Lull in Developments in Ontario

There was a lull in hydro-electric development in Ontario due to the completion in 1925 of a heavy construction program, the principal units of which were the Queenston-Chippawa plant at Niagara and the Cameron Falls plant on the Nipigon river. These two stations of the Ontario Hydro-Electric Power Commission with 550,000 horse-power and 75,000 horse-power capacities respectively were completed in 1925. Before undertaking a further heavy program the Commission has availed itself of a block of about a quarter of a million horse-power from the Gatineau plants above referred to and has contracted for this power, delivery to commence in 1928. The Commission has other large enterprises in view which, together with the developments already commenced of the Spruce Falls Company at Smoky Falls on the Mattagami river and of the Backus-Brooks Company on the Seine river, of 70,000 horse-power and 37,620 horse-power respectively, will maintain Ontario in its high place amongst the water-power provinces of the Dominion.

New Developments in British Columbia

New development in British Columbia was but little behind that of last year and amounted to 45,860 horsepower. Of this 25,860 horse-power was contributed by the Powell River Company and 20,000 horse-power by the West Kootenay Light and Power Company, which, by the addition of its third unit, completed its 600,000 horse-power plant at Lower Bonnington Falls on the Kootenay river. This company is carrying on preliminary work in connection with a new 60,000 horse-power development at South Slocan. The British Columbia Electric Railway Company completed its storage dam at the outlet of Alouette lake and proceeded with the construction of the 12,500 horse-power Alouette power station. The same company also continued with its Bridge River project, the initial capacity of which will be 54,000 horse-

power and the scheme as a whole is expected to have an ultimate capacity of from 550,000 to 700,000 horse-power.

Developments in Manitoba

In Manitoba additions to the existing plants of the city of Winnipeg and the Manitoba Power Company amounted to 43,200 horse-power, 15,200 horse-power of which was represented by the addition of units 15 and 16 to the city's station at Point du Bois on the Winnipeg river. This plant is now completely installed and has a capacity of 109,000 horse-power. At Great Falls on the same river the Manitoba Power Company installed unit No. 3 of 28,000 horse-power capacity and let the contract for a similar unit to be installed during 1927. In addition the company completed the work necessary to permit the forebay level to be raised so as to provide the full designed head, and built a steel-tower transmission line from the plant to the mill of the Manitoba Paper Company at Fort Alexander.

Developments in New Brunswick

In New Brunswick 2,600 horse-power of new installation was due to the replacement of a unit in the plant on the Aroostook river of the Maine and New Brunswick Electrical Power Company. The chief activity, however, was the initiation of work at Grand Falls on the St. John river where construction of an initial installation of 60,000 horse-power was begun by the St. John River Power Company. The New Brunswick Electric Power Commission carried out further work in connection with its Musquash system and is investigating the Meductic Falls site on the St. John river about 40 miles from Fredericton. The Bathurst Company has investigated the Nipisiguit river; it is thought that some 40,000 horse-power will be developed for use in the company's pulp and paper mills.

Legislation Affecting the Industry

Important legislation affecting the pulp and paper and allied industries has been a feature of the year. The Legislative Assembly of Quebec passed a bill prohibiting the export of hydro-electric power. This applies to all new developments and to the renewal of existing contracts. A similar policy has been adopted by the Ontario Government, which is working in close harmony with Quebec in the matter.

The Quebec Government has also announced a definite policy for protecting existing paper mills before opening further virgin timber lands for exploitation by entirely new projects, and has made it plain that no one will be permitted to utilize Crown lands at present unalienated, for the construction of new paper mills, until the existing paper mills are assured of raw material to make them permanent revenue-producing assets.

The purpose of this policy is two-fold, namely, to conserve the supply of pulpwood and to obviate as much as possible the threatened over-production of newsprint. Premier Taschereau stated, in announcing the policy, that he would rather have a relatively small number of large and prosperous companies than a large number of small companies competing with each other on a non-renumerative basis.

Supplies of Pulpwood

With regard to the supply of pulpwood, the inroads on existing stands is causing some anxiety. Ellwood Wilson, the Laurentide Company's forest expert, is possibly responsible for the Quebec government's new policy, for some time ago he announced that it was time to call a halt to the construction of new paper mills and to the addition of new machines to existing mills, as the present mills would soon be "at each other's throats for the possession of the markets." He estimates that to meet the requirements of existing miles 1,532 square miles of forest land will be cut over each year and he says that as the shortest possible time to produce a second crop is between 50 and 60 years, it is obvious that the present situation calls for something more than "viewing it with alarm."

Protection in British Columbia

British Columbia is apparently determined to give its paper mills equal protection, and a recent refusal on the part of the Government to grant new interests preference in a forest being opened up near an old mill is evidence of its stand.

Ontario has not declared itself in this matter, but in view of the progressive policies of that province there is no reason to believe it will lag behind Quebec. In Manitoba, where forest lands are under Dominion jurisdiction, there is evident a tendency to go slowly in dividing up timber areas among mills.

TWO OF THE FOUR 270 INCH FOURDRINIERS, THE LARGEST IN THE WORLD, BEING INSTALLED BY THE CANADIAN INTERNATIONAL PAPER CO., AT ITS NEW PLANT AT GATINEAU, QUE.

Ontario Has Year of Steady Developement

New Construction Is Proceeding Unusually Fast With Large Additions to Plants at Port Arthur, Fort William, Kapuskasing and Other Important Points—Little Reference Now in Ontario in Regard to Embargo on Pulpwood From Freehold Lands—Loss by Forest Fires Is Greatly Decreased During the Year—Some Concern About Over Production But on the Whole Prospects for 1927 Are Bright.

Written Especially for the Annual Number of the Paper Trade Journal by G. W. Brock.

Ontario is the second most important pulp and paper province in Canada, standing in this respect next to Quebec. The development of the industry has been steady and satisfactory. Construction is proceeding faster than ever with large additions to plants at Port Arthur, Fort William, Kapuskasing and other points, while the production of old concerns is being increased. The pulpwood areas of Ontario are by no means exhausted and the available supplies are such as to lead those who have given the matter close study, to the conviction that the work on some projected mills, long contemplated, will be proceeded with during this year.

Large Amount of Pulpwood Cut

It is interesting in this connection to note that the amount of pulpwood cut in Ontario in 1925 was 1,734,176 cords, of which 439,250 cords were exported and the balance consumed in the mills of the province. The figures of paper production for 1926 for Ontario are not yet available, those of 1925 being the latest. They show that, in that year, Ontario produced 601,630 tons of newsprint, 814,696 tons of mechanical pulp, 331,239 tons of sulphite pulp, 47,533 tons of book and writing papers, 18,563 tons of wrapping paper, 106,408 tons of paperboards and 7,923 tons of other paper. This is a satisfactory showing and the output for 1926 was even greater than that of 1925.

It may be stated that for the calendar year of 1926, the total exports of pulp and paper from Canada were valued at $173,491,635 as compared with a total of $154,555,951 for 1925. The increase for the past twelve months was $18,935,604 or over 12 per cent.

The exports of pulpwood from Canada were somewhat smaller in 1926 than in the year previous, the total being 1,391,738 cords, as compared with 1,423,502, exported in 1925.

The exports of wood-pulp during the past year were valued at $52,077,122 and exports of paper at $121,414,513, an increase over 1925 of $4,145,217 in the value of pulp exports and of $14,790,469 in the value of paper exports.

The greatest increase was shown in the exports of news print, which rose from 1,401,655 tons valued at $98,945,337 in 1925 to 1,731,986 tons valued at $114,089,595, a gain of 330,331 tons in quantity and $15,144,258 in value.

News Print Industry Expansion

It is thought in some circles that newsprint production may receive some setback during 1927 as the executive of the various companies expect a slight overproduction. The news print industry has however come through a period of years, some of which were threatening, with confidence and optimism, and so far as 1927 is concerned, there are no visible dark clouds on the horizon. Old established and ably-managed news print companies will likely continue to operate at maximum capacity and there is no doubt but that their earnings will be well maintained. They have all come through periods when it has been necessary to limit production to some extent and have emerged from such periods without loss to the shareholders.

For grades of paper other than news print, Canadian manufacturers depend largely upon the domestic market and upon markets in overseas countries. The domestic market is not large and is further restricted by volume of imported paper which is a detriment to Canadian manufacturers. On the whole, however, the mills have experienced a good demand and the gradual improvement in business conditions throughout the Dominion has been of material assistance. In the overseas markets keen competition is encountered from the European producers but Canadian exports have been considerably larger than in the previous year and big shipments, of book, writing and wrapping papers have been made to overseas countries, the principal customers for these grades of paper being Australia, Great Britain, New Zealand, Mexico and Japan.

Wholesale Paper Demand Good

The wholesale paper business during 1926 was on the whole good although at times very spotty. Prices were well maintained and on the average there was a slight reduction all around but the paper trade emerged from the past twelve months with few casualties. The excellent work of the wholesalers' association and close cooperation with the mills and with one another had a steady as well as a stabilizing effect and price cutting was not resorted to on any large scale, except now and then on special lines to meet foreign competition. The mills were well employed and jobbers used superior merchandising methods to get rid of slow moving lines. House organs, sample portfolios, direct-by-mail publicity and broadsides all had a good influence in stimulating trade and calling attention to seasonable lines.

Then too, better organization achieved something and more intensive selling was done, while credits were carefully watched. There is a tendency in the industry so far as distribution is concerned toward centralization and consolidation and it is becoming more and more difficult for the smaller dealer to get a foothold in the business. This has come to pass through jobbers having to carry so many and varied lines to meet the manifold wants of the average printer and paper consumer, the quick response with which all orders have to be met and the more efficient service that generally has to be rendered to keep up with the procession and the changing conditions of the times. The cost of doing business has been increasing all the time by reason of numerous small lot orders, more frequent deliveries, wider publicity, larger staffs to cater to specialized demands and augmented warehouse expenses. Profits so far as the wholesaler is concerned are not as satisfactory today as a few years ago but volume has extended a great deal.

Two Great Paper Centers

Port Arthur and Fort William are becoming great paper centres in northwestern Ontario. At Kapuskasing there will be a tremendous development by the Spruce Falls Power and Paper Company during the next two or three years. The mills in the Niagara district were all well employed but it is in the northern part of the province that the most outstanding development is taking place. Iroquois Falls, Espanola, Sturgeon Falls, Dryden, Fort Frances, Kenora and other towns are flourishing centres of production and, with the extension of the T and N O railway to the

north, new limits of pulpwood will be tapped. Any concessions in the timber line now granted by the Ontario government contain a clause to the effect that the pulpwood must be turned not only into pulp as formerly but into paper and this further processing will mean the employment of a larger number of hands in the mills.

Little Reference to Embargo

Very little is heard in Ontario at this time in reference to an embargo or export tax on wood cut from private lands. The pulpwood business is better than it has been for many months; mills are securing their supplies more and more from settlers and farmers and are conserving as far as possible their own holdings for future requirements.

Ontario, in the northern part, is developing rapidly with good motor roads and the opening up of new sections.

Forest conservation is receiving wider attention and the aerial patrol inaugurated by the Department of Lands and Forests has proved wonderfully effective in survey work, mapping and detecting forest fires in Ontario.

Authorities are continually sounding a warning that the present thriving pulp and paper industry in the province will in a few years face a shortage of raw material unless sane methods of logging are adopted, with a view to conserving the spruce wood which produces the finest quality of paper. Business men are being aroused on the question and now believe that forest cropping is fully as important to the Dominion as wheat cropping and up to the present has been sadly neglected. By moving pictures, literature, lectures and travelling educational cars sent out by the Canadian Forestry Association, the public is being awakened to the urgent need of greater conservation and more scientific methods in harvesting wood as well as greater care and precaution against fire by tourists, fishermen, hunters and others who flock to the forests every season. Neglect and fire have in the past taken too heavy a toll of Canada's great natural heritage and thousands of acres of virgin timber have been ruined by lumbermen or devastated by flame.

Forest Fire Loss Less

The establishment of the aerial patrol service by the Department of Lands and Forests for Ontario, as already stated which was inaugurated some four years ago, has achieved all that its most ardent advocates predicted. During 1926 the forest fire loss in Ontario was less than that of any previous year by some 105,000 acres while the actual number of fires was reduced by 54, comparing 1926 with 1925. In 1922 with only 102 forest fires, the loss in Ontario was 346,193 acres. The decrease in the area wasted, however, represents to an important extent, it is claimed, the vigilance and alertness of the aerial patrol which keeps the entire area of the province's forest wealth under daily surveillance from the air. The location of fires while they are yet in their incipient stages, is the most important factor in keeping the fire loss of the province to a minimum.

In 1922, before the air patrol was adopted, the number of fires was 102 and the loss 346,193 acres; in 1923, the year of the Northern Ontario conflagration, the number of fires was 1,343 and the loss 2,121,148 acres; in 1924, with the air patrol established, the number of fires was cut to 851 and the loss to 146,017 acres; in 1925, the number was 1,159 and the loss 187,497 acres, and in the year just closed the number was 1,105 and the loss 82,611 acres.

Much Pulpwood Shipped

During 1926 much pulpwood was shipped from the Thunder Bay district to various plants in the United States. Several contractors are engaged in this work while a number of American concerns have their own pulpwood headquarters at Fort William and Port Arthur. The Hammermill Paper Company, of Erie, Pa., which has for years maintained an office in Fort William, under the direction of M. Cochran, purchased over 65,000 cords of wood in 1926. In addition, 6,700 cords of peeled wood are ready for shipment next season. Cordage is loaded at Moffat Straits, Fluor Island, Port Arthur, Thunder Bay and Cloud Bay. The sum of $20,000 was spent in 1926 on floating equipment and a new loading machine constructed.

Sixteen timber and pulpwood contractors operate in the Thunder Bay district with headquarters at Port Arthur, Ont. The number of men employed by these firms in the camps during the winter is over 4,000 while, in the summer months, there is on the payroll about 1,000. The total annual amount paid out in wages is over three and a half million dollars and the entire quantity of pulpwood handled yearly is 250,000 cords and 1,150,000 railway ties. The biggest quantity of wood handled was by the Russell Timber Company, amounting to 35,000 cords a year. E. E. Johnson, Don Clark, G. W. Cox, the Newago Company, the Hammermill Paper Company and others are among the leaders in pulpwood activities, handling annually from 20,000 cords a year up.

New York Times Mill at Kapuskasing

The most extensive structural work is that being undertaken by the *New York Times* and the Kimberly-Clark Company, of Neenah, Wis., at Kapuskasing, Ont., under the direction of the Spruce Falls Power and Paper Company, which will make that town the premier manufacturing place of the continent. The company is investing $25,000,000 in buildings and equipment. The eventual output of news print will be 550 tons daily and 200 tons of sulphite. A logging railway has been built from Kapuskasing to Smoky Falls, a distance of 50 miles, and a big power plant will be constructed at the latter place. At Smoky Falls there are 75,000 hp. available, as well as at other sites, and 4500 square miles of leased lands which the power company can harness.

A second unit was installed by the Provincial Paper Mills at the Port Arthur Division where a 165-inch paper machine has begun operations. The plant was started as a 50-ton proposition in 1917 and the first product was turned out the following year in sulphite pulp. In 1923, a 146-inch paper mill was added for the production of book and writing papers. In the same year a 35-ton ground wood mill was put in commission. This will be increased to 100 tons daily while additions have been built to the finishing room, the beater room and the wood room.

Superior Paper Mills to Start

The Superior Paper Mills, which will begin operations in March, at Thorold, Ont., having been granted a fixed assessment for a term of years, will turn out about 1200 tons a year of tissue paper and 2700 tons of light-weight specialty paper. The old mill of the Peerless Pulp and Paper Company, which has been idle for some years, has been fitted up with two machines of the cylinder and Fourdrinier types. J. M. Cathcart, of St. Catharines, and John T. Berhalter, of Toronto, are the principals in the Superior Paper Mills and both have had long experience in the paper line. The assessment of the company has been fixed at $10,000 for a period of ten years, a by-law to that effect having been carried by a large majority of the ratepayers on June 25 last.

The new straw board plant of the Hinde & Dauch Paper Company, which has been erected at Trenton, Ont., will, it is expected, be put in operation early in March. The equipment is now being installed and the output will be 50 tons a day. O. H. Moore, general manager of the Hinde & Dauch Paper Company, Toronto, supervised the erection of the plant which will supply a large quantity of raw material for the operation of the company's mill in Toronto.

Canadian Cellulose Co. Opens Mill

The plant of the Canadian Cellulose Company, of Cornwall, Ont., which is being operated by interests close to the Howard Smith Paper Mills, will produce between 40 and 50 tons of soda pulp daily. The soda pulp not absorbed by the Howard Smith Paper Mills, will be disposed of on the open market. At the present time a good demand prevails for this grade of chemical pulp. While the initial output of the Canadian Cellulose Company will be only about 50 tons a day, yet its ultimate capacity will be from

80 to 100 tons. In order to bring the plant up to this point, no additions to the present building will be needed—only the installation of extra machinery.

Acquires Mattagami Pulp Co.

Another important transaction took place when the Abitibi Power and Paper Company, Limited, of Iroquois Falls, Ont., acquired the plant of the Mattagami Pulp and Paper Company, Limited, at Smooth Rock Falls, Ont. For some years the Mattagami Pulp and Paper Company, of which S. R. Armstrong is mill manager and William Ellis, general superintendent, was in the hands of a liquidator and in October last the assets of the company were sold at public auction in Toronto to I. W. Killam, president of the Royal Securities Corporation, Montreal, for $7,250,000.

Smooth Rock Falls is located about sixty miles from Iroquois Falls where the Abitibi Power and Paper Company's machines turn out about 550 tons daily of news print. The Mattagami Pulp and Paper Company owns an area of 125 square miles and 848 square miles under license and purchases each year about 75,000 cords of pulpwood for consumption. The output is 200 tons daily of pulp, half of which is bleached.

Within a short time it is expected that arrangements will be completed for the financing of the new subsidiary of Abitibi Power and Paper Company, now known as the Mattagami Pulp and Paper Company. An application has been made by Abitibi to the Government for a charter for a new company that will be operated under a different name entirely from that of Mattagami. Final arrangements will be rapidly completed for the financing of the new organization. This, it is understood, will take the place of first mortgage bonds and debentures that will be offered to the public. The assets of Mattagami were purchased recently for an amount believed to be somewhat in excess of $7,250,000. The Mattagami Company itself had first mortgage bonds outstanding to the extent of $1,759,846 and debentures of $3,935,000.

Beaver Wood Fibre Co. Makes News Print

Within the past year the Beaver Wood Fibre Company, Limited, of Thorold, began the production of news print, turning out 65 tons a day. Alterations were made to the company's pulp and board plant to accommodate the paper machine, the wire of which is 166 inches wide and 75 feet long. The buildings of the Beaver Wood Fibre Company are of steel, reinforced concrete and brick.

The Spanish River Pulp and Paper Mills, of Sault Ste. Marie, erected an addition to its plant. The extension consisted of the rebuilding of the present boiler and power plant with the installation of two steam turbo generators and auxiliary equipment. Pulp grinders and other machinery will be installed at the mill.

The Thunder Bay Paper Company, Port Arthur, is erecting a 125-ton news print mill and will add another unit during the coming year. The company also run a ground wood mill of 125 tons capacity. The Thunder Bay Paper Company is building a 75-ton pulp mill equipped with two digesters. The company expects to begin producing paper in its first unit before the end of the present year.

Strachona Paper Co. Adds Machinery

The Strathcona Paper Company, Strathcona, Ont., added a new beater and made other improvements to the plant and increased the capacity from 600 to 800 tons monthly. A new building was erected over the waste paper platform, 65 by 120 feet, which is used for storing all stock.

The International Fibreboard Company's plant, which was burned at Midland, Ont., is being rebuilt and additional equipment has been installed.

Cameron & Fraser, Simcoe St., Toronto, installed a plant for the manufacture of egg carriers and similar lines from pulp made from waste paper. A beater was put in and it is expected that the output of the company will be increased during the coming year.

The Kenwood Mills, of Arnprior, Ont., manufacturers of felt and other wool products for paper mills, erected an extension, 90 by 150 feet, and also a new office building. The expenditure of the company on these additions cost about $250,000.

New Sulphite Mill at Fort William

A new sulphite pulp mill was completed by the Fort William Paper Company, of Fort William, with a capacity of 75 tons daily. Additional machinery will be installed to bring up production of the news print within two years to 440 tons daily.

The Daverin Paper Mills, Limited, of Camden East, resumed operations a few months ago after a thorough reorganization. Dan Daverin is the president and general manager of the company. Radical changes in the piping system and water supply were made, ensuring a uniform, clean product. Production is confined to bonds, ledgers, envelopes, offset, writing and high-grade specialties.

The pulp mill of the Great Lakes Paper Company, Fort William, was busy during the past season. While the plant confined its activities to pulp, it is expected that, after certain matters have been arranged, a news print mill of large capacity will be added. More than 200 men are employed in the pulp mill and many settlers are engaged during the winter months in cutting wood to supply the needs of the company. Pulp made at the Great Lakes mill is being shipped constantly to the paper mills at Fort Frances, International Falls and Kenora, Ont., where it is converted into news print.

Manitoulin Pulp Co. Builds

An addition was erected at the plant of the Manitoulin Pulp Company, at Kagawong, Manitoulin, which was completed in November last.

The Nipigon Corporation, Nipigon, has negotiations under way for a site for a proposed pulp and paper mill. The initial plant will be equipped for a daily output of 400 tons.

The Hygrade Corrugated Products, Limited, have completed plans for a proposed new plant on Adelaide St., London, consisting of a main one-story unit 135 feet by 210 feet, and a one-story power house, 32 feet by 35 feet.

The Fort Frances Pulp and Paper Company has plans under way at Fort Frances for a new hydro electric power project. The power development calls for three, individual hydro electric stations in the district with gross capacity of from 25,000 to 30,000 hp. Plans for an addition to the news print mill are expected to mature at an early date. The entire project is reported to cost in excess of $2,000,000.

The Carpenter-Hixon Company, which took over the white pine limits of J. J. McFadden, Limited, will carry out large construction work at Blind River. The company was recently organized with an authorized capital of $5,000,000 and will deal in logs, timber, pulp wood, etc. The concern is one of the most progressive that has been organized for some time.

Lincoln Pulp & Paper Co. Improvements

During the past year a number of improvements in operating conditions were made at the plant of the Lincoln Pulp & Paper Company, Limited, Merritton. The company made splendid progress during the past year and regards the outlook for 1927 as favorable.

The Kenora Paper Mills will increase production at Kenora by about 10 per cent early this year, owing to the installation of a new boiler and other equipment. The plant is very busy and the new railway, which is being built by Mr. Backus and his associates to open up the English River pulp wood limits, will be proceeded with this summer and make available a large amount of pulp wood and timber wealth.

The Carthage Machine Company, of Belleville, Ont., which is the Canadian branch of the parent industry in Carthage, N. Y., has been very busy during the past season owing to the pulp and paper mill expansion in Ontario, and the outlook for 1927 is considered excellent.

French Paper Market Has Distressing Year

Industry Is Disturbed Through the Year By Numerous Adverse Influences Which Depress Prices of Paper and Increase Prices of Paper Making Materials—Lack of Protection on the Part of the Government Through the Imposition of Sufficiently Heavy Import Duties Is Especially Resented by Paper Manufacturers—All Branches of the Industry Remain Unsettled in Spite of Efforts to Solve Difficulties

Written Especially for the Annual Number of the Paper Trade Journal.

The French paper market at the beginning of 1926 was rather quiet, but all the mills were busy and there was no lack of orders. Machines which had been shut down for quite a long time were being started up and the installation of new machines was being considered.

The current demand was due to speculation and to lack of confidence in the franc, as those who owned francs preferred to convert them into raw materials with as little delay as possible. Manufacturers and merchants were focussing their attention on the solution of the financial problem.

Business Falls Off in February

In February orders began to fall off, slowly, it is true, but regularly. The trend of the market was more regular, and the difference between supply and demand was accentuated daily. Some of the mills, except those making news and printing papers, saw the possible need of slowing down production before the end of the month. It was a waiting market, and no one could prophesy when a change would come as the financial discussions of the day were casting doubt and suspicion in all branches of industry.

Paper importers were putting forth their best efforts to secure orders from their former customers, and at times accepted considerable reductions in price. Foreign papers were appreciably cheaper than the French papers, while the prices of raw materials had not changed appreciably since the beginning of the year. Waste papers had risen slightly, while rags were almost completely ignored, so much so that rag stock firms were becoming seriously alarmed. By this time the United States and England had almost completely ceased buying, and the market for new and old rags as well as for cordage was practically dead.

A Slight Increase in Price of Paper

The beginning of March witnesses a slight increase in the prices of paper, and this increase it seemed would be maintained during the following months. The increase in the tariff had aroused a large number of manufacturers and merchants, and the daily press had taken the lead by threatening its readers to increase the price of newspapers unless the tariff on news and similar papers, and also on the pulps used in their manufacture, remain unchanged.

The fall of the franc had a serious effect on the prices of waste paper, fillers, glue, size, felts, wires, belting, coal, etc., as well as on those of chemical pulps and of ground wood. Talk of increasing prices was heard in all quarters. Only rags remained stationary, and certain grades had fallen off somewhat.

On the whole the mills were well booked with orders and a number of wholesalers whose stocks were very low were experiencing considerable difficulty in renewing them. Prices were still rising and remain practically inversely proportional to the value of the franc. The prices of paper were merely nominal and they varied quite widely from one mill to another.

Difficulty in Obtaining Foreign Pulp

At the beginning of April the prices of paper showed a slight increase over the March prices due to the increasing difficulty of obtaining foreign chemical and mechanical pulps. The fantastic prices of 1920 had not yet been reached; but they were daily drawing nearer.

The Government committed a crying injustice against the French paper industry. The customs duties on all goods imported into France, whatever be their nature, were increased 30 per cent, but news and book papers were exempted. Such action was most disconcerting, and it appeared as though the men at the head of the State were doing their best to kill the French paper industry.

The mills continued well booked with orders, but the situation brought about by the continued fall of the franc was causing them much worry. A number of manufacturers refused to set a price beforehand, but invoiced the goods according to the rate of exchange of the franc at the time of delivery. Chemical and mechanical pulps were becoming daily more expensive. Rags and waste papers, on the other hand, had not changed appreciably. The other paper making raw materials, and especially rosins and foreign fillers, followed the upward trend of the pound. A number of important deals were put through by foreign buyers who were attracted by the differences in prices when calculated in francs and in exchanges which had not been depreciated. News print, which was quoted at only 220 to 230 francs at the beginning of the year, had risen to about 250.

Falling Off of Orders in May

During the month of May there was a slight falling off in the booking of orders. Buyers, impressed by the present situation, which remained most unstable and uncertain, hesitated to build up their stocks.

The sharp rise in foreign exchanges at the beginning of the month had created great disturbances in all branches of the French trade and industry. Everybody was anxiously wondering whether the situation would become still worse, thereby causing the ruin of all manufacturers and merchants and throwing hundreds of thousands of men out of work.

Fortunately, the wise measures taken by the Government reversed the situation. Transactions became as numerous as before and confidence, which had almost completely disappeared, was beginning to come back.

In order to avoid extremely disagreeable surprises, for some little time French manufacturers had been endeavoring to establish the prices of paper according to the rate of the pound sterling or of the dollar. This step was most praiseworthy, as it did away with unending discussions and quibbling with the purchasers.

The price of paper was nearer than ever to the peak prices of 1920, and yet the mills barely covered their expenses. This most abnormal situation was due to the burden of increased taxes of all sorts, which overwhelmed the paper industry, and especially to the complete enforcement of the eight hour day law which forces manufacturers to employ a larger number of men, who frequently are incompetent to carry out the delicate work with which they are entrusted and are the cause of much trouble in manufacturing operations.

Paper mill supplies remained very expensive. Waste papers were rising steadily. Rags alone remained practically stationary.

Exchange Problem Dominant

The exchange problem dominated all other questions during the month of June. Manufacturers awaited impatiently the results of the often-promised measures, which up till now had but a temporary effect. The franc was again falling in spite of all that had been said and promised.

The prices of all raw materials were increasing in an alarming fashion. The workmen, unable to make ends meet with their wages, grew restless again. But most alarming of all was the fact that the balance of our foreign trade since the end of last year was against us.

On all sides complaints were heard about the high price of paper; but it should be remembered that in 1920 news cost 350 francs per 100 kilos, when our franc was worth 60 gold centimes (about 12 cents), while at this time news print cost only 250 francs and the value of the franc had dropped to barely 16 gold centimes (about 3.2 cents).

All the mills were very busy and some of them even refused orders. Greaseproof manufacturers were booked ahead for several months and paper machine builders also were booked ahead, one well known firm of the Isère having orders for two years ahead.

The price of foreign news had fallen slightly. Paper machine felts had again risen 10 per cent. All the raw materials for paper making were rising, and even rags, which had remained unchanged for several months, rose slightly owing to buying from the United States.

The Financial Problem

In July the financial problem had become the predominating thought of foreign as well as of French pulp and paper manufacturers, and it was stated that the Scandinavian mills would be willing to contribute to the improvement of the franc if they were certain that their efforts would not be in vain. The interest of the Scandinavian pulp exporters was due to the fact that France is one of their best customers, and many of the mills in Norway and in Sweden sell nearly the whole of their output to French firms. The steady fall in prices of pulp and paper from Northern Europe which had taken place for some time was due exclusively to the continued decrease in purchases in France. Moreover, the Scandinavians feared that the French paper mills and newspaper publishers might purchase their pulp and paper from the German mills.

Despite outward appearances of great prosperity, the paper mills on the whole were in a very precarious position. The business situation remained unchanged. The paper and board mills had a large number of orders on their books; but the amount of capital required to operate the mills was ever increasing, and fear was growing that the situation might continue indefinitely, causing serious trouble and innumerable difficulties.

The price of raw materials and of all the paper mill supplies was still rising. Recent advances in the cost of wool have forced felt manufacturers to increase their prices by about 15 per cent. Owing to the instability of the franc it became increasingly difficult to obtain certain raw materials, particularly foreign pulps. A shortage of coal was feared unless the English miners' strike was settled in the near future. Waste papers were still rising steadily and were becoming increasingly difficult to obtain.

Custom Duties Raised

The customs duties were raised another 30 per cent in August owing to the increasing fall in value of the franc, though towards the end of the month there was a noticeable change for the better. A provisional trade treaty between France and Germany had been signed, whereby German papers and boards could be brought into France under advantageous conditions.

The market remains dull, but was somewhat affected by the rise in value of the franc. Buyers adopted a waiting attitude and bought only to meet their immediate requirements. The prices of raw materials had not changed appreciably. Aniline dyes had fallen slightly. The price of paper was rather weak as compared with July, in spite of an increase in transportation rates. Danger of a shortage of coal was increasing, as the English strike was dragging on monotonously with no signs of drawing to an end in the near future.

A Month of Reorganization

September was a month of reorganization, not only in France but also in all the European paper mills which were directly or indirectly affected by the war. Business had undergone several sharp and unexpected changes 1921, and in nearly every case periods of great activity were followed by periods of almost complete stagnation. For several years the French paper industrry had been extremely busy; and yet it was pervaded by a deep-seated uneasiness which broke out at intervals in the most unexpected forms.

At this time we were headed for a grave economic crisis, similar to that of 1920-21, the causes of which are to be found in the following fact: During the panic caused by the rapid fall in value of the franc everybody endeavored to convert their francs into goods of all sorts, including a goodly quantity of paper. When the franc began to rise again those who had rashly got rid of their money in this manner were faced with a terrible dilemma: they must either give up business or else sell at a considerable loss. We thus see a large Paris firm selling at 142 francs per 100 kilos the same grade of tar that a plant near Paris cannot make for less than 150 francs.

News print, which had gone above 300 francs per 100 kilos, had fallen to 265 francs. Scandinavian firms had signed contracts for delivery at the end of 1926 and beginning of 1927 at 13 pounds 10 shillings per ton, cif French port.

Business was hampered to a considerable extent by fresh taxes, and everybody was retrenching as much as possible in order more easily to bear the heavy burdens imposed on all Frenchmen with a view to balancing the budget.

Sacrificing Stocks for Cash

In October wholesalers who had large stocks on hand continued to sacrifice them for cash. Book and news mills were rather short of orders, and a number of them had shut down some of their machines or were running them slower. Prices were weak with a very decided tendency to fall.

The situation of the French paper industry was anything but promising. A number of mills had been storing practically the whole of their output for the several weeks while others had curtailed their production considerably. Manufacturers who had taken up the production of kraft and greaseproof papers were undecided as to whether they should keep on, as orders were becoming very scarce and foreign competition very keen.

In spite of complaints arising on all sides, the Government was doing nothing to counteract the flooding of our market with foreign papers. Germany, it appeared was overflowiing with papers and boards of all sorts, and was endeavoring to dispose of them by all the means in its power. All the civilized nations were trying to protect their home paper industries from the encroachment of the German goods. Italy, for example, had just raised its duty on news print from 5 to 8 gold lira per 100 kilos; and the Italian paper manufacturers considered that, in spite of this formidable duty, Germany could still offer its paper on the *Italian* market at interesting prices.

Pronounced Quiet in November

Owing to the rapid rise in the value of the franc, the quiet

which prevailed in all branches of commerce, and particularly in the paper trade, became even more pronounced in November, and the mills were trying harder than ever to secure orders to keep their machines running and avoid discharging their skilled paper makers. The paper market was completely disorganized and prices were in keeping with the state of the market. Raw materials were falling, particularly waste papers. On the whole the situation was very critical, and it was feared that it might become even worse.

The Crisis in Full Swing

In December the crisis was in full swing, and the year closed with the paper market in a state of utter stagnation. The book and printing paper mills were very hard hit and machines were being shut down daily. The cigarette paper mills were the only ones which were running normally.

A delegation of paper manufacturers interview the French premier to lay before him the extremely serious situation of the French paper industry, and they obtained a formal promise that the whole situation would be thoroughly investigated and the measures necessary to relieve it would be applied.

Trying to Restore Business

Manufacturers, merchants and consumers have joined in a common effort to try to restore business to the same degree of activity that it had at the beginning of the year. The prices of all grades of paper are still falling slightly, in sympathy with raw materials, especially waste papers which have fallen nearly 50 per cent.

In all branches of industry the situation remains unsettled, and serious efforts are being made on all sides to solve the pressing problems of the day, and particularly that of unemployment. German paper is coming into the country in ever-increasing quantities.

SLASH BURNING IN NORTHEAST

Ten per cent of the northeastern forests is so heavily blanketed with slash after the spruce and fir have been cut out for pulpwood that seedlings of the new forest can not grow, says the Forest Service, United States Department of Agriculture, which points to the necessity of destroying the debris of limbs and tops of trees from logging operations by burning at safe seasons.

This condition was found by research foresters of the Northeastern Forest Experiment Station, at Amherst, Mass., in the examination of large tracts of spruce forests in that region. Softwoods and hardwoods grew in equal numbers on this land, but the pulpwood operators had cut only the spruce and the fir and had left 30 per cent of the total area covered with slash, or logging debris of varying thickness. On the land not blanketed with heavy slash and not shaded too greatly by the hardwoods, the new forest was advancing. Forest conditions in the future, says the Forest Service, will be unsatisfactory unless the dense slash is carefully burned and seedlings given a chance to utilize this portion of the land.

Burning slash on pulpwood operations in these forests must, however, be so conducted as to avoid the serious harm that may follow a broadcast burn. The Forest Service approves of winter burning of slash as logging proceeds as the safest method. A fire may be started and fed with slash from the trees cut nearby, new fires being started as the cutting moves on. Thus, fire damage to seedlings, young growth, and unmerchantable trees is held to a minimum, as the area actually burned is negligible and there is rarely danger of fire spreading in the winter.

EMERSON CAREY MAKES IMPROVEMENTS

The Emerson Carey Fibre Products Company, of Hutchinson, Kansas, are making improvements in their beater room and are installing new keyed type bandless rolls built by the Dilts Machine Works, Inc., of Fulton, N. Y.

CANADA'S PAPER EXPORTS IN 1926

Exports of paper of all kinds from Canada during 1926 totaled $121,414,513, an increase of $14,790,467 over the total of $106,624,046 exported in 1925, according to advices from Consul Albert Halstead, Montreal, made public by the Department of Commerce. Exports of pulp of all kinds during the year amounted in volume to 1,003,081 tons, valued at $52,077,122, representing an increase of 43,410 tons in quantity and $4,145,217 in value over shipments totaling 959,671 tons valued at $47,931,905 in the preceding year.

During 1926 Canada exported 1,731,986 tons of news print, valued at $114,089,595, indicating an increase of 330,331 tons and $15,144,258 over similar exports in 1925 which amounted to 1,401,655 tons with a value of $98,945,337. At the end of 1926 there were 14,345 tons of news print on hand in Canada. During the year Canada's rated daily capacity of news print increased by 1,650 tons and at the close of the year the daily capacity was 7,350 tons. This represents an increase of 495,000 tons in the annual rated capacity and makes the total annual capacity 2,205,000 tons.

Of the exports of pulp from Canada during the past year, 382,077 tons worth $11,505,811 was mechanical pulp; 165,433 tons valued at $10,443,538 was sulphate; 200,995 tons with a value of $15,734,220 was sulphite bleached, and 254,576 tons worth $14,393,546 was sulphite unbleached. The latter was the only kind of pulp to be shipped in smaller quantities, the reduction being 9,278 tons, though the value was higher by $243,275.

In addition to the 1,731,986 tons of news print worth $114,089,595 exported during the year, 18,522 tons of wrapping paper with a value of $2,259,663 were exported; this represented a drop of 2,013 tons and in value of $519,635; 60,545 hundredweights of book paper worth $520,337 were shipped abroad representing increases of 12,780 hundredweights and $85,644 in value over 1925 exports and 19,044 hundredweights of writing paper worth $143,806 were exported, indicating gains of 6,673 hundredweights and $41,767. The value of all other foreign shipments of paper during the year was $4,401,112.

SURVEY OF NON-UTILIZED WOOD

The National Committee on Wood Utilization, Department of Commerce, will undertake a national survey of non utilized wood now considered as by-products of the saw mills, box factories and other wood-working establishments, with the idea of compiling this information in map form for convenient reference according to a statements issued by Axel H. Oxholm, Director.

This survey will be conducted by states and the first work will start in Virginia. Herbert Hoover, Secretary of Commerce is the Chairman and Colonel Wm. B. Greeley, Forester of the U. S. Agricultural Department is Vice-Chairman of the Committee which is made up of all groups of manufacturers, distributors and consumers of forest products.

The survey will be another step in the complete utilization of forest resources which is the ultimate aim of the Committee's work. The chief difficulty at the present time is that by-products industries have not always been able to locate the proper raw materials in sufficient quantities to justify the establishment of such industries in connection with the major forest products. The survey, it is felt, will undoubtedly aid in the building up of properly coordinated forest industries such as sawmills, pulp and paper mills, wood chemical plants, and many others.

This survey will be conducted in cooperation with the various Government Departments as well as trade organizations, local chambers of commerce and state authorities. Preliminary work of this survey is now being done and the questionnaires on which the survey will be based will likely go out from the Washington headquarters of the Commitee during the early spring.

DINNERS IN NEW YORK PAPER WEEK

Manufacturers, Merchants, Salesmen, Technical and Cost Men Hold Elaborate Banquets and Luncheons at the Leading Hotels.

Golden Jubilee Banquet of American Paper and Pulp Association Surpasses All Other Dinners of Organization and Is Attended by Record Number of Figures Prominent in the Industry—Senator McNary, of Oregon, Addresses Gathering on "Forestation and the Paper and Pulp Industry"—Explains Clarke-McNary Law and Appeals for Co-operation of Private Owners, States and Federal Government

Approximately one thousand members and guests of the American Paper and Pulp Association assembled at the Golden Anniversary Dinner in the grand ballroom of the Waldorf-Astoria on Thursday night, this notable event winding up the most interesting and the most widely attended convention in the history of the association.

Following the reception in the Astor Gallery, the guests and members marched to the banqueting hall and located their tables. "The Star Spangled Banner" was played by the orchestra, after which the assembly took their seats and proceeded to enjoy the excellent dinner provided.

The artistic menu and program contained the names and connections of the officers and executive committee of the association; the Committee on the Fiftieth Anniversary; the Banquet Committee; the Reception Committee; the names of the ex-presidents from the beginning of the association, and other timely information. This beautiful menu was engraved in gold, and was printed on Hadrian Book Paper, by the Osborne Company, of Newark, N. J.

An artistic souvenir was presented to each guest, consisting of a mahogany shield mounted with an appropriate metal design of the seal of the association, circled by views of the first paper mill, forestry operations, and a modern Fourdrinier machine.

Norman W. Wilson Toastmaster

Norman W. Wilson, president of the Association, was toastmaster, and seated with him at the speakers table were: Senator Charles L. McNary, L. R. Wilson, A. D. Coffin, L. M. Alexander, A. B. Daniels, Magnus W. Alexander, W. J. Raybold, Albert M. Miller, Henry W. Stokes, D. C. Everest, J. C. Mallalieu, George W. Sisson, Jr., A. C. Hastings, C. A. Crocker, Alexander G. Gilman and L. D. Post.

One of the most pleasing features of the evening was the presentation of a huge birthday cake with fifty lighted candles, by the celebrated "Oscar" of the Waldorf-Astoria. The gathering joined with the toastmaster in thanking Oscar of the Waldorf for his generous act. In the course of his opening address President Wilson took the occasion to congratulate L. D. Post, who is celebrating the fiftieth anniversary of the *Paper Mill.*

Senator McNary Speaks

After reading numerous congratulatory cablegrams, telegrams and messages, the toastmaster introduced the speaker of the evening, the Hon. Charles L. McNary, United States Senator from Oregon, who gave an instructive address on "Reforestation and the Paper and Pulp Industry," which was greatly appreciated by those present. Senator McNary said in part:

"In the uncertain world of business one of the nearest approaches to a certainty is timber growing. The man who invests his money into growing timber does not have to worry much about business cycles. The risks that he has to run are pretty well known. Fire, insects and disease are the chief uncertainties and every day we are learning more about how to combat them. Taxation of forest properties is still on an unscientific basis in most States but this problem is arousing widespread interest, is being studied intensively and is going to be solved. These and other problems of direct import to the pulp and paper industry are now receiving the attention of a great many scientists and economists. In fact, if we include the chemists who are working on problems directly or indirectly related to the manufacture of pulp and paper, I doubt if there are many industries so well represented in scientific and economic research.

Work of Forest Products Laboratory

"Despite the amount of work which has been put into the development of new and improved methods of pulping and paper making since the wood-pulp process came into general use, it was not until recently that advances were made which give promise of revolutionizing the industry, or at least important parts of it. I refer to the adaption of the neutral sulphide process which has been worked out at the forest Products Laboratory, and the Mason process by which wood is exploded into a fibrous condition. These two developments are among the chief advances made during this century.

"Less spectacular perhaps, but of great importance, has been the application by your industry of research to manufacturing problems, particularly to the elimination of waste. The results of the studies of pulping rotten wood, the development of use of kinds of wood previously considered unfit for pulping, and the tightening of processes in the actual line of mill operation are all important. There is hardly any stage in manufacture of either pulp or paper which has not received at least some scientific attention. It is my opinion that the present work in research, great as it may seem at the present time, is but a start.

The Clarke-McNary Law Explained

'In producing the largest quantity of wood at the lowest price, there is probably no one thing of greater importance at the present time than the detection, prevention and control of forest fires. In this work the Federal Government and the States have a real interest and responsibility. The Clarke-McNary Law was devised to assist in providing for forest protection as a great cooperative job to be undertaken and put through by the private owners, the States and the Federal Government working in close harmony. This law provides for the determination and recommendation of adequate forest fire protective measures. It enables the Federal government to share the cost of the forest fire protection work engaged in by the States and private owners. One million dollars has been appropriated by Congress for the conduct of this work during the period of July 1, 1927 to June 30, 1928, which represents an increase of $290,000 over the amount provided for the previous fiscal year. Today the Forest Service is cooperating with a total of 33 States in forest fire protection, the total money—Federal, State and private budgeted by the States for this work being approximately three and a quarter million dollars. Considering that

PICTURE TAKEN AT THE FIFTIETH ANNUAL BANQUET OF THE AMERICAN PAPER AND PULP

ASSOCIATION AT THE WALDORF-ASTORIA HOTEL, NEW YORK, THURSDAY EVENING, FEBRUARY 24, 1927

some private money is spent in fire protection in addition to this sum, we can be encouraged by the fact that a substantial start in forest fire control has been made. When we realize, however, that it will take more than ten million dollars to meet the situation adequately, we can see that there is a large undertaking ahead.

"There are other features of the Clarke-McNary law which are of real interest to the paper industry, the provision for cooperating with the States in the production and distribution of forest planting stock to farmers and the provision for assisting the owners of farms in the establishing, renewing and improving their woodlands. There may be more significance to the paper industry in these activities than might be generally believed.

"This program of forest research is one of the ways of attacking the problem of adequate timber supplies, which is of vital importance to us all. Cooperation under existing law is another. The solution is one in which it behooves us all to pull together for the common good. I hope that the time is not far distant when through your support and the support of other public spirited agencies adequate provision will be made for forest research, forest fire protection, and timber growing on a scale commensurate with the needs of the Nation."

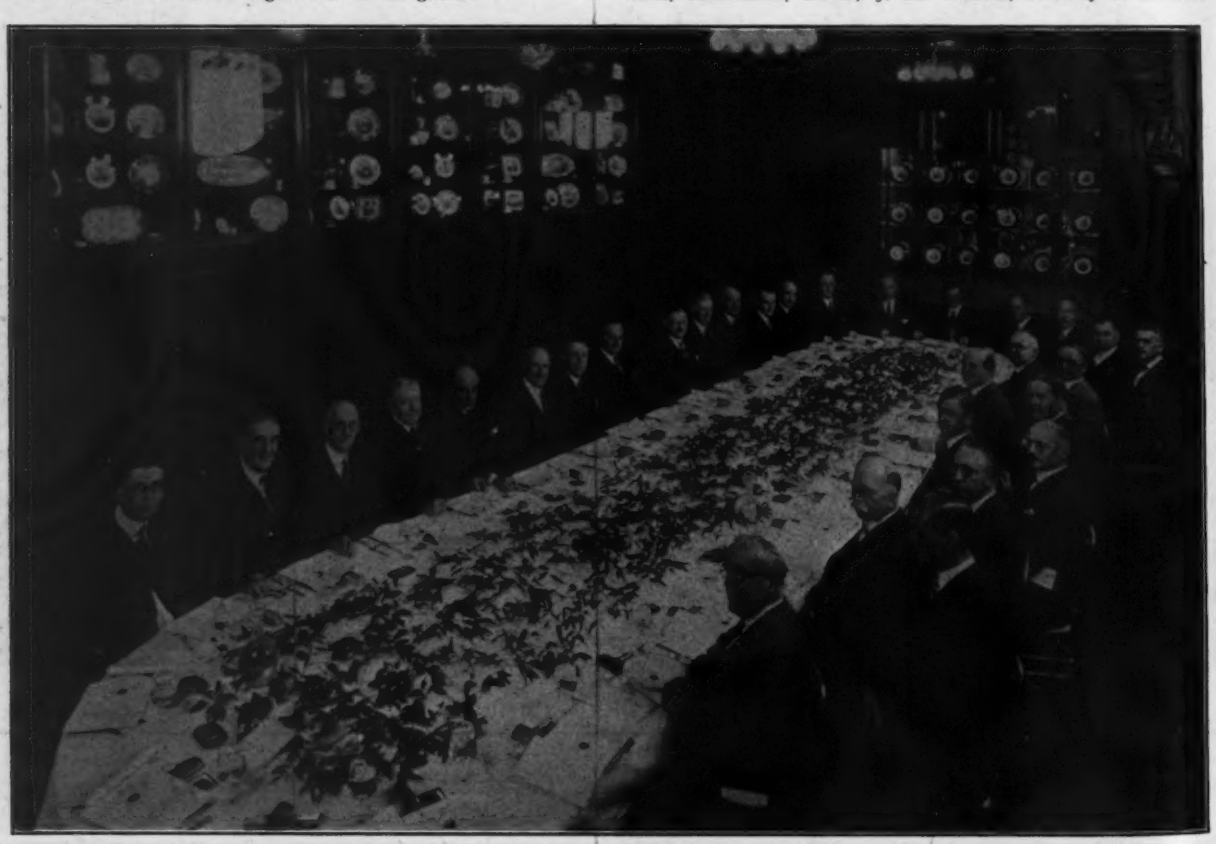
Following Senator McNary's speech, former President George W. Sisson, Jr., of the Racquette River Paper Company, Potsdam, N. Y., and former President Walter J. Raybold, of the B. D. Rising Paper Company, Housatonic, Mass., who have both helped materially to raise the industry to the high position it enjoys today, spoke on "Our Industry."

PRESIDENT'S LUNCHEON

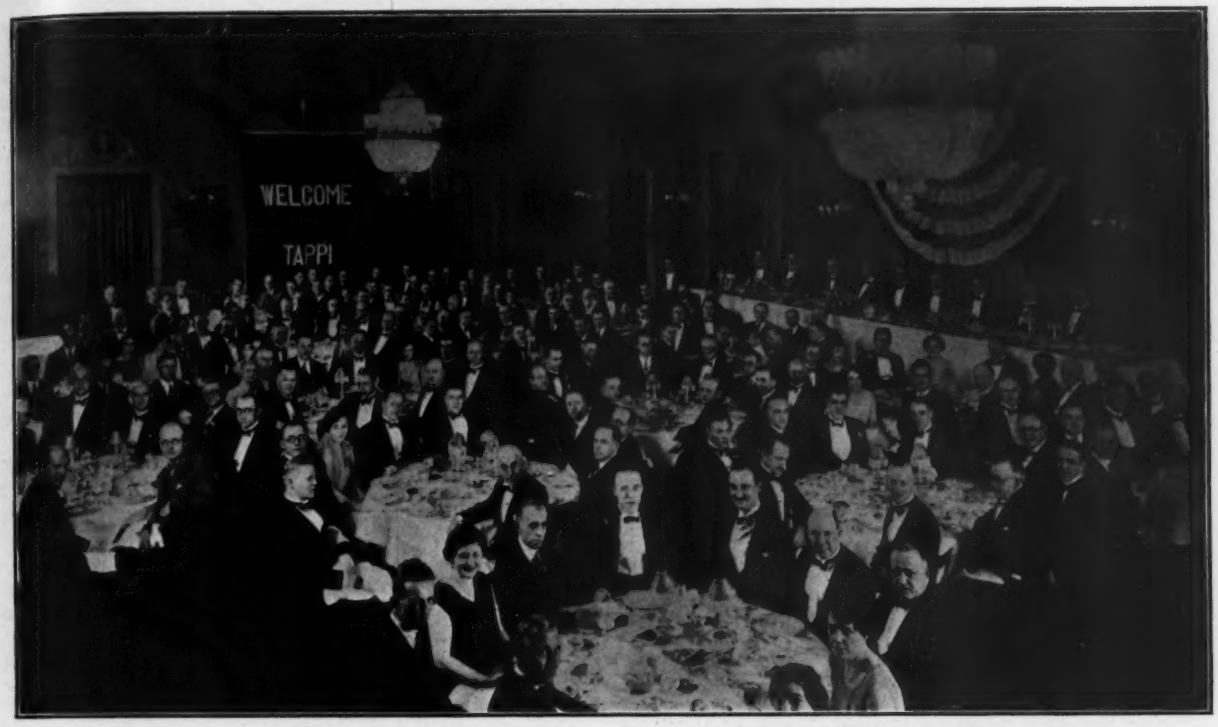
The President's Luncheon was held at 1 o'clock, Thursday afternoon, and in recognition of the fact that this year the Association is observing its fiftieth annual convention, the function was more elaborately observed than usual. It was held this year in the banquet hall of the Waldorf Astoria instead of one of the dining rooms and there was an augmented list of guests.

A flashlight picture was one of the innovations of the occasion. President Norman W. Wilson spoke briefly of the growth of the association and predicted that its influence was destined to develop in an unprecedented manner during the next few years.

The following were present at the dinner:—L. R. Wilson, Abitibi Power and Paper Company, Ltd., Montreal; Henry W. Stokes, York Haven Paper Company, Philadelphia, Pa; Norman W. Wilson, Hammermill Paper Company, Erie, Pa.; Henry Burn, Wall Paper Manufacturers of the U. S. A., New York City; George W. Sisson, Jr., Racquette River Paper Company, Potsdam, N. Y.; A. C. Hastings, Cliff Paper Company, Niagara Falls, N. Y.; J. C. Mallalieu, George W. Millar & Co., New York City; L. M. Alexander, Nekoosa-Edwards Paper Company, Port Edwards, Wis.; J. P. Brunt, Container Corporation of America, Chicago; D. C. Everest, Marathon Paper Mills Company, Rothschild, Wis.; G. H. Rady, E. J. Keller Company, New York City; Raymond Bee, United Paperboard Company, New York City; W. N. Wilkinson, Union Sulphur Company, New York City; Minor M. Beckett, Beckett Paper Company, Hamilton, Ohio; Arthur Havemeyer, Package Paper Company, Springfield, Mass.; J. H. Kline, York Haven Paper Company, York Haven, Pa.; R. N. Fowler, Hampden Glazed Paper and Card Company, Holyoke, Mass.; Hugh P. Baker, Executive Secretary of American Paper and Pulp Association; Albert M. Miller, Central Ohio Paper Company, Columbus, Ohio; Walter J. Raybold, B. D. Rising Paper Company, Housatonic, Mass.; E. F. Eilert, United Typothetae of America; A. B. Daniels, L. L. Brown Paper Company, Adams, Mass.; C. A. Crocker, Crocker-McElwain Company, Holyoke, Mass.; L. G. Reineman, Buffalo Envelope Company, Buffalo; W. W. Sunderland, Oxford Miami Paper Company, West Carrollton, Ohio; Francis H. Evans, Greeting Card Association, New York City; Alex G. Gilman, Allied Paper Mills, Kalamazoo, Mich.; J. M. Weaver, Keasbey & Mattison



PRESIDENT'S LUNCHEON AT THE WALDORF-ASTORIA HOTEL



BANQUET OF THE TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, COMMODORE HOTEL.

Company, Ambler, Pa.; W. L. Garter, Nashua Gummed and Coated Paper Company, Nashua, N. H.; R. P. Andrews Paper Company, Washington, D. C.; Z. W. Ranck, Crystal Tissue Company, Middletown, Ohio; Frank L. Stevens, Stevens & Thompson Paper Company, North Hoosick, N. Y.; Fred J. Rooney, Upson Company, Lockport, N. Y.; George K. Spence, New York and Pennsylvania Company, Johnsonburg, Pa.; George Goodsir, McLaurin-Jones Co., New York City; Walter E. Perry, Chemical Paper Manufacturing Company, Holyoke, Mass.

TECHNICAL ASSOCIATION BANQUET

The Technical Association of the Pulp and Paper Industry held its twelfth annual dinner at Hotel Commodore, Wednesday night, with 175 in attendance. An excellent orchestra furnished music while the courses were being served and an entertaining program was provided at intervals by the following artists: Miss Consuelo Hughes, violinist; Miss Vera MacIntyre, soprano; John Kane, comedian, and Don Regos, tenor.

George K. Spence acted as toastmaster for the after-dinner program and introduced as the first speaker Dr. Gerald Wendt, Dean of Chemistry and Physics at Pennsylvania State College, who spoke on "Cooperation between the Colleges and Industry."

Dr. Wendt referred to the meetings of the Technical Association which he had attended during the week and said that while he was an outsider he could not refrain from saying that as a university man he had found them full of inspiration. He had been especially interested in the discussions which had touched on training in industry and felt that the colleges were not fulfilling the demands and training men for industry as they should.

Just what was wrong with the colleges that the men sent by them into the industries so often proved misfits? One trouble was that they still held to the old idea of producing the society scholar. College was to the student too much of a country club or a city club. He had recently had an agonizing time with some boys who had shown that they did not realize the opportunity the college afforded them and he had told them that he thought it was a waste of time and a waste of money. They had pleaded to stay just one more year and had shown their ideaof college and its opportunities when they had told him that it was all right for "Dad has plenty of money and we have plenty of time." They were typical of a very large group which appreciates colleges for various other things but not as a means of getting ahead.

As long as a man's mind was capable of growing he believed it should have an opportunity to grow and those who were sincere in their desire to have their minds grow were the men that industry should have.

One great trouble was that men did not see that college had anything to do with their careers. That wasn't entirely the student's fault. The fact that college men took so keenly to their sports, dramatic and other activities showed that they had good stuff in them. Part of the fault lay with the faculties which were inclined to be static. Students were more inclined to respect men who do things than men who merely know things. The professor who did things was the one who got the most respect from his students.

Dr. Wendt declared that men with creative minds were not attracted to the colleges. There were various ways in which the colleges and industry could cooperate. Industry would profit if it would let the colleges know more about its problems. He had seen men rejected in college who went into industry and came back to college later entirely different men. The reason was that they had been aroused to their opportunities. If proper effort was made to arouse that appreciation of opportunity, the man would in most cases respond and both the colleges and industry would be benefitted.

Prof. B. K. Sandwell of Montreal, the other speaker, possesses a quaint humor and kept his hearers amused throughout his remarks. His talk was all the more amusing because it could be taken as a paraphrase of Dr. Wendt's preceding address.

He began by saying that the title of professor was in his case a misnomer. He had been a professor for seven or eight years but had been trying ever since to forget it. He thought the colleges made a big mistake in not cultivating the students with rich fathers. It was the popular custom to throw them out if

their examination papers did not show a certain mark. But the Universities wanted the money and the young people wanted to stay in them so why not let them through no matter what their examination papers showed, providing their fathers would come through with $25,000 or so. The colleges could do a lot of things with that money. Perhaps they might be able to raise the salaries of the professors. He had tried to impress the desirability of this plan on various colleges but he had never been able to get any of them to take it up and that had been one of the reasons why he had got out.

He had always been fond of associating with technical people. His own technique lay along poetical lines. "But," he added, "I do not practise the making of poetry any more than you do the making of paper."

Speaking of technical research, Prof. Sandwell said that it apparently dated to Adam and Eve and he thought that Satan was the first technical expert on record for he had come into the Garden of Eden disguised as a snake and had tendered his unsolicited advice just as it was so often done today.

But, to sum up what technical research had done, it appeared that it had m[illegible]bled **us to pool** our intellectual resources. Its chief contribution to the human race had been in discovering means by which more of us could live in a given area.

WASTE MERCHANT'S BANQUET

The New York Association of Dealers in Paper Mill Supplies, Inc., held its nineteenth annual banquet in the North Ballroom of the Hotel Astor on Wednesday evening, February 23, and the event proved to be the most sucessful of its kind ever held by the association.

The genial members of the Banquet Committee, Walter H. Martens, Charles Passonante and Alfred J. Moran, were on hand early to greet the guests, and create the intimate atmosphere so essential to the success of such an occasion. The attendance was 300, tables being reserved for the occasion by the following concerns:

American Woolstock Company, Sol Ash, Inc., D. Benedetto, Inc., Box Board and Lining Co., C. F. Bradley, Vito G. Cantasano, Geo. Carizzo Company, Darmstadt, Scott & Courtney, Delia Waste Products Corporation, Economy Baler Company, S. J. Fisher, Inc., Gaccione Bros. & Co., R. F. Graham, E. Gross & Co., E. J. Keller & Co., Thos. A. Kelly, Inc., Leshner Paper Stock Co., D. Manzolillo & Co., Chas. A. Mastronardi Geo. W. Millar & Co., Inc., Millar & Volker, A. J. Moran & Co., Inc., Association National Waste Material Dealers, Republic Paper Stock Company, Sterling Mill Supply Company, United Raw Material Corporation, Wilson Paper Stock Company.

The entertainment programme was well balanced including Friedberg's Master Songers, Foster Welsh, the one man band, and in addition a unique innovation, The Entire Revue of the Swanee Slub of New York was transplanted from the 156th Street headquarters, and warbled and danced for the delectation of the diners being billed as "Chicken without too much dressing."

The journal issued for the occasion was exceptionally well gotten up and much credit is due to the journal committee for the artistic results of the labors.

The members of the committee were Joseph P. Gaccione, Chairman, Joseph Benedette, Louis Markowitz, Dominick J. Palmieri, Alfred J. Moran. As usual long banquet speeches were omitted.

WOODLAND SECTION'S DINNER

The informal dinner of the Woodlands Section of the American Paper and Pulp Association was held on Wednesday night in the Waldorf-Astoria.

Major W. Du B. Brookings, manager of the Natural Resources Production Department of the Chamber of Commerce of the United States, gave a splendid address on "Commercial Forestry," during which he declared that the National Chamber looked to the American Paper and Pulp Association to render a large measure of assistance in establishing commercial forestry throughout the country.

Major Brookings concluded his speech by stating that it would be hopeless to ask for public support of the policies mentioned if there were not outstanding instances to show the good faith of timberland owners and wood users in putting them to practice.

BANQUET OF THE NEW YORK ASSOCIATION OF DEALERS IN PAPER MILLS SUPPLIES, HOTEL ASTOR

BANQUET OF THE SALESMEN'S ASSOCIATION OF THE PAPER INDUSTRY, WALDORF ASTORIA HOTEL

"Your industry," said Major Brookings, "furnishes many such examples, and the National Chamber in its efforts to make the public carry its share of the responsibility in solving our forest problems expects to call frequently on the experience of the members of your association."

SALESMEN'S ASSOCIATION DINES

The eighth annual banquet of the Salesmen's Association of the Paper Industry, held on Tuesday evening, in the Roof Garden of the Waldorf-Astoria, proved one of the most successful ever held by this organization. Appropriate souvenirs were provided the guests and, with a large attendance of the fair sex present, the event was a riot of beauty and color.

After an excellent dinner, President Walter E. Perry made a brief, but appropriate, address. He read a telegram from E. A. Hussey, a charter member of the Association, who has been seriously ill at his home in Boston, thanking the executive committee for sending flowers, together with a message conveying their love, sympathy, and hope for his speedy recovery.

Mr. Perry introduced the Rev. Horace Percy Silver, Rector of the Church of the Incarnation, New York, the principal speaker of the evening. Mr. Silver was formerly chaplain at West Point, where he was greatly beloved.

The reverend gentleman described the present period as the "Paper Age," and said that we were living in a period of startling changes. He said that the ladies formerly dressed like Old Mother Hubbard, whereas today they are attired like Old Mother Hubbard's cupboard, a remark which created roars of laughter.

In a more serious vein, he impressed on the gathering the importance of all good citizens using the ballot. He spoke of what we owe to the ancient nations, and said that the pathetic thing was that these nations practically destroyed themselves with living a life of luxury and ease.

He stressed the necessity of working for our salvation, and said that America's greatest contribution to civilization was "Work." Mr. Silver declared that he did not like the popular slogan "America First," but preferred the slogan "America First—to Serve," a motto which was noble and fine.

Mr. Silver went on to say that one of the mightiest forces in development of character was business, and that we needed to be busy to save ourselves by ourselves. He said that if we had strength to work, and work to do, every day should be an "Anthem of Praise." He concluded by appealing to Americans to lead in service to all nations, so that we may be a benediction to all mankind.

Following the Rev. Mr. Silver's address, President Perry introduced the newly elected president, James H. Coy, who was vociferously received by the gathering, and ended the formal proceedings with a few well chosen remarks.

Afterwards most of the guests adjourned to the ball room, where they danced to the strains of an excellent orchestra until the early hours of the morning.

Congratulations for the success of the event are due to the banquet committee, consisting of Endicott Rantoul, chairman; George H. Attfield, Robert C. Fay, Alan B. Helffrich and A. R. Melker.

COST ASSOCIATION LUNCHEON

Two particularly practical addresses were listened to by those who attended the luncheon of the Cost Association of the Paper Industry which was held at 12:30 o'clock Tuesday noon.

The first speaker, Freas B. Snyder, president of the Brotherhood of Locomotive Engineers' Title and Trust Company, of Philadelphia, Pa., had for his subject, "Shekels vs. Papyrus."

Referring to the fact that he had once been engaged in the paper manufacturing business, Mr. Snyder said that the bank men were fond of referring to him as a paper manufacturer who had gone wrong. He then proceeded to tell what, in his opinion, was wrong with the banks and what was wrong with the paper industry.

The banks, he said, were too hidebound and too prone to judge all classes of business by a single standard. They were woefully ignorant of the problems of the paper industry.

"Not to know is not a crime," he declared, "but the hopelessness of the situation lies in the fact that they do not want to learn." Continuing he pointed out some of the popular misconceptions bankers have of the paper industry and its problems.

As to the paper industry, he charged it with being undercapitalized and overproduced. As soon as a mill began creating a specialty, imitators began to crowd the market and idle machines were bound to be the result.

Another trouble with the industry was that it was underpriced. Too often the price was fixed by the man and not by the cost of production. "In my experience," he asserted, "I have found that the more a man knows about costs the less likely he is to fix prices to get business instead of fixing them to get profit."

In closing he said that if bankers understood the problems of the industry they would view the paper manufacturer's balance sheets from a different angle and that for that reason the manufacturers should try to get the bankers to know their business.

Prof. Thomas H. Sanders of the Graduate School of Business Administration, Harvard University, spoke on "The Relation of Cost to Selling Prices."

It was a general idea, he said, that the relationship between the two was very slender. Some economists claimed that there was no distinct relationship although, in the long run, there was a close relationship. There was a popular theory that wherever the selling price was such that those engaged in any particular line could not make a living there would come a natural adjustment. Some would very kindly get out and the rest would then be able to make a living. The question was—which would get out and which would stay in? Some producers, specially favored, might be able to produce goods and sell them at a margin of profit where others could not. It stood to reason that the latter would be the ones to drop out. Costs could give the manufacturer an idea whether he was destined to be one of the survivors or whether he would be one of the shipwrecked.

In studying individual concerns one comes upon those which have idle capacity and who would like to increase the volume of their product. That condition brings the temptation to ignore cost and go after the business. The onus was on the sales department to improve that situation. It was not a situation for which price-cutting was the proper remedy.

Where the general condition of an industry was satisfactory there was a tendency toward a general stampede. The manufacture of specials is engaged in and costs are "doped." When everybody is trying to make a sideline of what others are making their general line the result is demoralizing. That is the wrong way to make a living.

Some business concerns might resort to price-cutting as a way out and it migh get them out but, if everybody resorted to it, general demoralization was bound to follow. It was never good accounting and not good business to try to cloak the situation by disguising costs.

Prof. Sanders told of a questionnaire he sent out to secretaries of business associations of every sort. He received answeres from 22 secretaries whose associations represented 10,700 different business firms.

The purpose had been to get their views on the relationship between cost and selling prices. Ten of them had replied that they believed costs and market conditions contributed equally to selling prices. Eight had placed market conditions first and costs second. Two had given it as their opinion that costs primarily ruled the selling prices. One had said that he believed the cost alone determined the selling price.

Regarding the latter, Prof. Sanders said: "But I do not believe that that particular business will enjoy any particular rush of orders because of that view." Then he won a laugh when he explained that the response had come from the Secretary of the National Association of Casket Manufacturers.

In closing the speaker said that his real message was that price cutting was not the means through which to attain the salvation which business seeks. Business should rather seek to bring about improved conditions of marketing and a higher quality of products. The most pernicious conditions, he said, were apt to be found where there were no published quotations to go by. Experience had proved that where there were publicly quoted prices there was a strongr tendency to adhere to them. Lines should be worked out for public quotations, he said, for that was a business safeguard.

NATIONAL PAPER TRADE BANQUET

Believing that a change in the form of entertainment usually provided to wind up the convention would be welcomed by the members, the National Paper Trade Association this year decided to hold a theatre party and supper dance on Wednesday evening. This innovation undoubtedly met with unanimous approval, with the result of a record attendance, approximately six hundred members and guests attending the events.

The theatre party was held at the Imperial Theatre, where the outstanding musical success of the current season is being presented, and everyone present thoroughly enjoyed the magnificent performance of "Oh, Kay." The work of Gertrude Lawrence, Oscar Shaw, Victor Moore, Betty Compton, Constance Carpenter, Gerald Oliver Smith, Harland Dixon, Marion and Madelein Fairbanks, Harry T. Shannon, Sacha Beaumont, Janette Gilmore, Paulette Winston and Frank Gardiner, was greatly appreciated.

The show was a riot of beauty, color and melody. George Gershwins' music was in his inimitable vein, and practically all of the numbers and dances earned repeated recalls. The dancing, in particular, was far above the average. The principal song hits were "Clap Your Hands," "Do-Do-Do," and "Someone to Watch Over Me," all of which are popular successes of the season.

Following the theatre, the gathering adjourned to the Hotel Astor Roof, where an enjoyable supper was provided. To the strains of an excellent orchestry dancing was enjoyed until the "wee' sma' oors" of the morning.

Opinions were heard on all sides that this was the most successful and enjoyable affair ever arranged by the association, and congratulatiaons are due to the entertainment committee, consisting of Robert R. Lasher, chairman, Lewis A. Alliger, Richard C. Kettles and David S. Landau, for their assidious efforts towards the success of the event.

PAPER MAKERS' ADVERTISING CLUB

The Paper Makers' Advertising Club had its annual luncheon in Room 112, Wednesday noon. There were twenty-five present but no special speakers were scheduled. A short time was spent after the luncheon in discussing the club's affairs.

CANADIAN CELANESE TO START PLANT

The new plant of the Canadian Celanese Company at Drummondville, Que., on which construction work began some eight months ago, will come into operation about the middle of March, with imported yarns, as it will be some time later before the spinning department is ready to open. The Company possesses the sole rights for the Dominion of Canada to manufacture cellulose acetate and articles produced therefrom under the Dreyfus patents and processes.

R. N. MILLER RETURNS FROM BRAZIL

Roland N. Miller, who sailed for Sao Paulo, Brazil, last May, to investigate for the St. Paul Railroad Company, of Sao Paulo, the possibilities for establishing a paper mill there, with the idea of using eucalyptus wood, has returned to New York. Mr. Miller reports that the question of constructing the suggested paper mill has been postponed until after the proposal has been considered by the shareholders of the company.

A. P. & P. A. HOLDS 50th CONVENTION

Golden Anniversary of Foundation of American Paper and Pulp Association Is Celebrated at Waldorf-Astoria Hotel, New York City

D. C. Everest, of the Marathon Paper Mills Co. Is Elected President of the Organization for the Ensuing Year—Reports of the Officers Show That the Association Is In Prosperous Condition and Has Never in Its History Been So Favorably Situated To Serve the Entire Paper and Pulp Industry as at the Present Time—Membership Constantly Growing—Reports of Various Meetings

The Fiftieth annual meeting of the American Paper and Pulp Association got under way at 10:45, Thursday morning. There was a fair attendance when President Norman W. Wilson called the session to order. The minutes of the previous annual meeting were approved without reading, after which President Wilson made his address. The report of Secretary-Treasurer Hugh P. Baker was accepted without reading and ordered filed for printing.

P. S. Hanway contributed an interesting talk on "The Raw Material Situation in the Pulp and Paper Industry." Saying that the paper industry probably spent in the neighborhood of $300,000,000 annually for raw material, he declared that there was some of this that should be saved. He then proceeded to show why the industry should study certain outside influences which, although they could not hope to control, they should watch the trend of. The reason why so many had not given more attention to these subjects was probably because the information at hand was not in most cases sufficient. By means of charts he showed how these outside influences worked to affect the industry. He also pointed out how the costs of raw materials used by other industries had a very material effect on the raw materials used by the paper industry. That it was most important to study the trend of all these influences was vividly shown by him through means of the charts.

The membership committee reported on the two year continuous membership campaign which has been waged since President Wilson appointed the special membership committee to conduct an aggressive canvas for new members in the Spring of 1925. The report showed that in 1925 the association gained twenty new members which represented a daily tonnage of 7,289. In 1926 there was a gain of 30 new members but due to the fact that there were few large mills to work on this new membership represented only 1,665 daily tonnage. The committee stated that there were few large mills that were not now in the association and that the present membership represented 68 per cent of the daily output of mills in the United States.

The nominating committee placed in nomination the following for the officers of 1927 and the secretary was instructed to cast a ballot for their election:

President, D. C. Everest, Marathon Paper Mills Company; Vice President, S. L. Willson, American Writing Paper Company; Vice President, Felix Pagenstecher, Bryant Paper Company.

Executive Committee: Hugh J. Chisholm, Oxford Paper Company; Norman W. Wilson, Hammermill Paper Company; Milton E. Marcuse, Bedford Pulp and Paper Company; W. L. Carter, Nashua Gummed and Coated Paper Company; J. P. Hummell, Hummell-Rose Fibre Corporation.

The new officers were given a rising vote of confidence after which Mr. Everest, the new president, thanked the association. He said he had noted that the duties of president had been increasing rapidly from year to year and he realized the enormity of the task that would devolve upon him. He said he only consented to assume those duties because he felt he could count on the same cooperation which had been given those who had preceded him.

The forenoon session adjourned at 12:25.

The afternoon session convened promptly at 2:30 but the order of the program was reversed so that the first matter of business was the committee reports.

C. W. Chabot, reporting for the Committee on Distribution told of the committees study of

D. C. EVEREST, PRESIDENT

the subject and said particular attention had been given to the 37 per cent of the tonnage of the paper industry which goes to the public as printing. Points he made were that the manufacturer should remember that the paper he was making to sell to the merchant the merchant had to sell again. He advised the merchant to concentrate on as fe wlines as possible and said that the best way to cut the cost of distribution was to increase the efficiency of the salesman.

National Stream Purification

H. E. Fletcher reported for the committee on National Stream Purification. He told of the progress the committee has been making and his report developed an interesting discussion of various legislative measures aimed at stream pollution in certain states.

The Paper Industry in 1927

The main address of the afternoon was on "General Business Prosperity and the Paper Industry in 1927," the speaker being John C. Howell. After the transaction of routine business the meeting was adjourned.

PRESIDENT'S ADDRESS

Norman W. Wilson, president of the Association delivered his annual address as follows:

It is a real pleasure to meet with you upon this our Fiftieth Anniversary and to present what custom has seen fit to term "The President's Annual Message."

In spite of the strenuous work of this our annual convention week, I am sure we must all feel inspired to accomplish in our business meetings today as much constructive work as possible.

Looking Backward

Because of the importance of planning for the future, I would much prefer to allow the work attempted during the past year to speak for itself, and devote my entire message to recommendations for the future. However, I have been persuaded that in order to properly introduce any very far-reaching suggestions for the future, it is necessary to go into some detail as to how your affairs have been handled and are being handled right at the present time. With that in mind I shall try to cover as broad a field as possible without consuming too much of the time allotted to our total program.

Guiding Principles

First and foremost I should like to state that every project undertaken and every decision made has been based upon the principle the industry at large. There has been a painstaking effort to observe that the purpose of this Association is to promote the welfare of the principle that this Association should avoid participation in any activity where the interests of the members clash and that our first duty in considering any project was to determine:

1st, will all of the membership be benefited? If so, act.

2nd, will the interests of part of the membership be benefited without damage to others? If so, act.

3rd, will the interest of some of the members be benefited at the expense of the balance of the membership? If so, refrain from action.

If there has been any case in which we have not followed the above principle, it has not come to my attention.

The next principle we have attempted to follow is that if action is desirable, let it be as prompt and effective as possible.

None of us will claim that we have measured up to this principle one hundred percent but I feel that we are going forward and that the future will find steady improvement in this respect.

Another principle, which the officers, the Executive Committee and the staff have tried to observe steadfastly, has been that when in doubt unhesitatingly to consult our membership, either as a whole or through the recognized leaders in each group in order to clear the way for a proper decision.

Reasons for Large Amount of Work

By the same token we have unhesitatingly called upon the members, through their recognized leaders, to carry on activities which your elected representatives and staff did not feel capable of assuming themselves. At the same time I have found the vice-president, the Executive Committee, and the staff not only willing to carry their share of the burden, but anxious directly to proceed with every piece of work which they were equipped to do rather than to throw the burden upon the shoulders of others.

I wish to go further, on behalf of the Executive Committee and the other officers, in an expression of warm approval not only for the willing but for the capable manner in which Dr. Baker, and the men and women associated with him, have conducted the affairs of the Association. There is an astonishing amount of work handled by that group. Much of it, to be sure, is detail in nature and yet all of it has to be supervised, directed, allocated to the proper people and carried through to conclusion.

Recognized Leaders Called On

I presume one of the reasons for the large amount of this work is that our industry is so diversified. In addition to matters of detail, every day seems to bring not one but often many matters quite out of the ordinary. Frequently information must be acquired before action is possible. All of this seems to have been carried on promptly and capably by the staff.

If there still be any question as to the need for a centralized headquarters for this industry, I am sure it would be removed from the most skeptical of our membership could they but spend a day now and then at the Association headquarters and thus become intimately acquainted with the work being done.

However, in spite of the willingness and ability of the staff to carry the major part of the lead, and the desire of the Executive Committee and the officers not to burden others with too much of a lead, there are certain pieces of work for which we have had to ask assistance. In such instances, your Executive Committee has authorized the appointment of committees who have unselfishly devoted their time and efforts on behalf of the members at large.

Finance

You will recall our financial troubles of some years ago. They were regrettable but valuable, and I trust that the strict economy resulting therefrom will continue to be practised so that every dollar that is spent may continue to bring us a higher return than could have been possible without this experience.

Due to added membership, and the action of some of our old members in voluntarily increasing their dues, we have been able to re-establish certain important services and also carry on new work. By strict economy we have carried through all work allowed in the budgets of the last two years; we have added some work and yet not exceeded the budget, and we have succeeded in establishing a moderate surplus. Principal credit for this is due to Dr. Baker and his staff because of their care to absolutely refrain from spending money until it was actually in hand.

While this in itself is a satisfactory situation, the fact remains, that such important work could not be provided for in the budgets, nor carried on because of limitation of funds.

Hope for More Adequate Income

I trust the time will come when we will have an income which will permit the industry to be served in many ways not thus far possible and, furthermore, that a material reserve can be set up making it unnecessary when an emergency arises to place work which should be done by this Association upon the shoulders of individual manufacturers due to our inability to finance the job ourselves.

This thought is not primarily mine, nor does it come from the

staff. It has been voiced to me on many, many occasions during the two years of my presidency.

Committee Activities

All committees of major importance are appointed through consultation with the Executive Committee and with members principally affected by or informed upon the subject in hand.

Always an effort is made to have representation for every group and every district affected. At times it becomes necessary to sacrifice the one or the other, in order to insure placing the work in the hands of those best qualified to get results.

Naturally the best men are not always available, due to absence or other commitments. Delays then result but if your patience has been tried, you have been most gracious about it.

Work of Principal Committees

Mention should be made of some of the principal committees now at work. Let us first discuss the Membership Committee because it has had so much to do with strengthening the Association, not only during the past year but during the year previous. The men composing it, and particularly the chairman, have had a long hard grind but they have stuck manfully to the task. They have brought in new members; they have persuaded old members, who had withdrawn, to reaffiliate themselves with us; they have brought the Association to a point more nearly representative of the entire industry as to grades of paper and types of mills, large and small; they have also persuaded a number of our members to increase their financial support.

Discontinued Work Renewed

Largely through this combination of activities, the Association has been enabled to expand its budget, to renew certain work that had been temporarily discontinued, and to undertake new activities not previously attempted.

Best of all there has been made available the advice, the counsel, and the influence of the executives of these new members, a number of whom have already evidenced a most encouraging willingness to shoulder their full share of our responsibilities, to work upon important committees, etc.

There will be a report of the specific results obtained by this committee later in the day but their efforts have been so painstaking and so beneficial to the Association that I felt obliged to make special reference to it at this time.

Stream Purification

This is a subject which has been with us, in one form or another, for many years, with each mill attempting to handle the problem practically single handed. Last year the industry decided to place the entire responsibility in the hands of this Association with the recommendation that an attempt be made to obtain cooperative action from the officials of those states where the subject was being, or likely to be, agitated, or where unreasonable legislation had been passed or was likely to be passed. This responsibility was accepted and a committee appointed whose efforts and progress are a credit to the industry. I am sure you will have no regrets for the action which you took last year when you receive the report of this committee.

Two other important committees are studying respectively "New Uses of Paper" and "Distribution." These have been more recently appointed and each has a complicated problem to solve. I am sure you will be gratified when you learn what they have under way.

Import Committee

You are all familiar with the fact that this committee was established and is being supported by the manufacturers individually and is not directed by this Association. The principal reason for this situation is that when the need for this committee became apparent, we did not have the money to finance it, or did we have as members a number of mills whose support was vital. Now practically all of the supporting mills are members of this Association. Furthermore, through interlocking directorates so to speak, close contact is maintained and real teamwork practiced.

I hesitate to say to what extent this industry, and therefore other industries connected with and at least partly dependent upon the paper industry, would have been damaged were it not for the fine accomplishments of the Import Committee, and I urge the continued support, financially and otherwise, of all concerned.

Earlier in the year, it seemed that the Import Committee appointed by the N. P. T. A. was showing an inclination to function in opposition to the Import Committee representing the manufacturers. At the recommendation of your Executive Committee this was recently brought to the attention of the president of the National Paper Trade Association. Assurances of hearty cooperation have since been given us and the merchants suggest a joint conference between the manufacturers' committee and theirs in order to insure complete harmony. I recommend that we assist in bringing these committees together. There are a number of other committees which have been called into service during the year and reports of which have been submitted to the members from time to time.

DR. HUGH P. BAKER, SECRETARY

Then there are committees made up of representatives of various industries to which certain of our members have been appointed. One of these is the National Wood Utilization Committee. This takes in all of the industries producing and using wood in one form or another. I presume you have observed reports by this committee in the daily press and magazines dealing particularly with products of the forest. This whole work is under the direction of a small Executive Committee which in turn operates under the direction of Secretary Hoover. You will be glad to know that Dr. Baker has recently been appointed to this Executive Committee by Mr. Hoover.

Another type of activity is illustrated by our representation on the Executive Committee of the Chamber of Commerce of the United States. I need hardly stress the growing influence of the Chamber. I am sure we are all gratified with our success in having Milton E. Marcuse elected to the Executive Committee of the Chamber, and grateful to him for the active part which he has taken.

We also have a National Councillor to the Chamber of Commerce in L. M. Alexander, who has ably carried our problems to them and brought back their problems to us.

Of equal importance is our contact with the National Industrial Conference Board. Mr. Sisson has been elected an associate member by the Board. Our Association membership entitles us to two delegates—C. A. Crocker, and until recently, E. R. Behrend, have been our delegates. Both have represented us ably and with regularity at the monthly meetings of the Conference Board. Dr. Baker and I have regularly received personal invitations to these meetings which he has attended regularly and which I have attended when possible.

Then there are frequent conventions and meetings of groups, large and small, in which we are invited to participate. Such meetings may be held in Washington, New York, Chicago or other important centers. Usually it has been possible for us to be represented through the good offices of certain of our members located in adjacent territories. When this is not possible, particularly in or near New York, Dr. Baker, Mr. Porter, Mr. MacNaughton, Mr. Burke, and more recently, D. A. Crocker and Paul S. Hanway, take care of these responsibilities. They also take care of European visitors, extending or receiving hospitality as the case may be. How they manage to survive is a mystery to me.

Foreign Contacts

For years this Association has been attempting to build up friendly relations with foreign paper and pulp producing countries and steady progress has been made. Our members have been encouraged to visit foreign paper and pulp mills when abroad. Dr. James E. Campbell made a definite contribution through his visit to Scandinavian countries several years ago and by means of the reception and courtesies which he recently extended here in New York to a prominent group of foreign and domestic manufacturers.

Our Executive Secretary, at his own expense, made a special trip to European pulp and paper producing countries shortly after he became associated with us.

Last spring the Association managed to finance a similar trip for Mr. Porter. We in turn have been visited by the leading European manufacturers who have been received officially by the Association and welcomed to a number of the mills of our members.

We have been invited to hold a conference with Scandinavian paper and pulp manufacturers in connection with meetings of the International Chamber of Commerce at Stockholm next June. Already two or three of our prominent members have declared themselves available. This offers the opportunity to appoint a Scandinavian Conference Committee which I am sure will meet with your approval.

Naturally, our closest contact has been with our Canadian friends. You will recall that at the last annual meeting, recognizing that so many problems of production and distribution, either in Canada, or the United States, were fundamentally the same, you authorized the appointment of a Committee to meet with a similar committee representing the Canadian Pulp and Paper Association. I am happy to refer to the cordial reception which this plan met with by the officials and members of the Canadian Pulp and Paper Association.

The plan was predicated upon a discussion of non-controversial subjects; in fact, your committee was restricted to that type of discussion as we understand was also true of the Canadian Committee.

You have had a report, through our trade papers, of the very cordial discussion which ensured and of the principal topics which were listed for consideration. The feeling of both committees is that certain of our problems may be solved at less expense of time, effort and actual money through joint action than either Association can accomplish single handed.

I, for one, am proud to have had part in this movement, confident that a better understanding, friendlier relations and tangible mutual benefits are bound to result. Above all things I believe the Canadian Committee members are convinced that we seek no benefits that are not mutual, and we are convinced that they on their part seek no selfish advantage.

Before leaving this subject I wish to read to you a resolution passed at the recent annual meeting of the Canadian Pulp and Paper Association:

WHEREAS, our sister organization in the United States, the American Paper and Pulp Association, is on the eve of celebrating its fiftieth birthday anniversary; and

WHEREAS, we recognize in the American Paper and Pulp Association a trade organization from which we have gathered much inspiration and one to which we are indebted for encouragement and assistance in the early days of our own Association; be it, therefore

RESOLVED, That we place upon record our acknowledgment of such indebtedness and our appreciation of the harmony and goodwill which have always characterized our relationship, and which this year have resulted in the establishment of a Joint International Committee representing both associations; and that we hereby extend to the American Paper and Pulp Association our most cordial felicitations upon their Golden Jubilee and our most earnest desire that many more years of progress, prosperity and usefulness may follow.

In response you will doubtless wish to make appropriate reply later in the day.

We are engaged in world commerce, whether or not we realize it. We must have full knowledge regarding the production, consumption, and stocks on hand of our principal raw materials. We must have even more complete information as to the total production, consumption and stocks on hand of the material we produce and sell. We must have other statistics including the closest knowledge as to the volume and trend of general business at home and abroad.

With this in mind authority for the employment of a skilled statistician was given at the last annual meeting. One of the particular hopes which we had was to employ a man who not only could take care of general statistical work but would also be of such calibre as to be able to accurately reflect a digest of the many economic services now being purchased by our members, apply this to the Paper Industry, and eventually save our members the money and the time now expended on perhaps five or six of these economic services.

Just such a man was found available and in the few months he has been with us he has made a fine impression. He is to appear on the program later in the day and at that time I shall be glad to present him to you.

Every week letters are coming in from our members, expressing the opinion that the weekly report is already commencing to replace the outside service.

This is a fine illustration of economy through centralized effort.

Tariff Protection

The commerce of this Nation has been extended to its present volume upon the basis of protection to domestic industry. So long as this general policy is continued, this country cannot possibly maintain its equilibrium with the commerce of the Nation at large unless protected to the full extent of the present law.

We have already sacrificed the future development of certain important branches of our industry through lack of proper tariff protection. A study of the facts discloses that even where pro-

tection is now afforded, it is upon a lower basis than applied to many other domestic commodities.

The responsibility for this whole subject has been placed in the hands of a Tariff Committee whose personnel will, I believe, give satisfaction to the entire membership. It is the plan of this committee, probably through sub-committees, to consult directly every branch of the industry in order to bring each branch into complete harmony as to its own tariff requirements, so that when the main committee finally presents its recommendations to the proper authorities, these recommendations may have absolutely undivided support from our entire membership.

It is further hoped that this committee may then be in position to speak not only for the pulp and paper producers of this country, but may have the support of all who depend wholly or in part upon this industry for their commercial existence.

You can readily visualize the size of the job which the Tariff Committee has undertaken and I am sure we must all be grateful to the men who have agreed to undertake this work, and further, that we will evidence our appreciation by complete and wholehearted cooperation with them.

Recommendation for the Future

I realize that an executive, upon the eve of his retirement, may hurt rather than help the new administration by proffering too much advice; and yet, whether his contributions have been large or small, his experiences should enable him to recognize what weaknesses exist with some idea of how they might be corrected; where the principal strength lies and how it might be further capitalized and extended.

I have been urged to speak without restraint. May I do so?

Perhaps our principal weakness has been our inability to establish complete membership of all producers of paper and pulp in this Association. This has been very substantially corrected by the pronounced success of the Membership Committee. Nevertheless, even now there are several prominent influential mills and quite a number of smaller ones whom we have not been able to persuade; on the other hand, very recent experiences with some mills, who heretofore had shown no interest whatever, justify the belief that it is getting to be somewhat easier to bring outside mills into the Association. Perhaps this is because of some of the problems which obviously need united action, perhaps because our entire membership seems to be so cordially inclined toward the Association and so willing to help in every way possible, and even perhaps because the Association is actually making itself felt a little more effectively year by year.

Whatever the reason, I am convinced that conditions are ripe for another membership drive and I urge that this be put into execution without delay.

Thorough Organization of Affiliated Groups

In addition to complete membership in this the central Association, each important group should be organized. The fact that certain groups are not organized at all, and others only partly, is proof that this statement may not meet with your immediate approval. But above all things, let us face the facts.

The statistician finds an extremely chaotic condition in his attempt to obtain complete statistics, particularly pertaining to unorganized groups. Part of the trouble results from confusion as to classification and terms. While the central organization can eventually, and will if you wish it to do so, clear up this confusion and furthermore, not only assemble but distribute statistics as to group production, consumption, etc., the officers and staff agree that most of this information should come to us after having been obtained and analyzed by each individual group.

Then in turn our statistician could concentrate his efforts upon the group information obtained, place it side by side for such comparisons as you may wish, and also give you complete, reliable figures for the total industry.

Furthermore, more practical use of this information can be made by the individual mill, if his group is compactly organized and holds quarterly meetings at which this information is studied.

Let us first consider the situation with our pulp mills: The Pulp Producers Association has been in existence for a number of years. For some reason or other its membership has been relatively small, so much so that its officers and Executive Committee have repeatedly questioned the advisability of continuing it. Each time this question has arisen, it has seemed advisable to carry on if for no other purpose than too maintain at least a skeleton organization in the event of some emergency arising requiring group action to protect the interests of the pulp producers.

It is my earnest recommendation that the leaders in this field give this subject renewed consideration.

Let us now consider paper: At the time of our last annual meeting the following important groups remained unorganized: Book, Bristol, Glassine, Greasproof, Waterproof Wrapping, Absorbent Papers and Specialties.

At the present time we are assisting two of these groups to ganize. We have also assisted the Grocery Bag Manufacturers to reorgainize. They in turn have applied for membership in the A. P. & P. A., and we also have application from the Wall Paper Manufacturers, Envelope Manufacturers and Book Binders Association. Of the groups still unorganized several have the matter in hand. The Executive Coommittee joins me in recommending the leaders in each group lend their assistance to this movement.

There is another type of organization which should be fostered, well typified by the Supply and Equipment Association, Inc. This was organized about two years ago and is found upon the platform of supporting our activities morally and financially. This platform has been strictly adhered too by these good friends. Our appreciation can best be evidenced by a continuation of hearty cooperation with them in assisting to extend their membership and otherwise working closely with them.

Future Financial Structure

Until recent years our income was derived principally through the various associations who are members of the A. P. & P. A. In 1923 this method was changed and since then each member pays his dues direct to us. When the present structure was arranged the committee in charge sought to establish a common basis for all, calculated upon the annual sales or production of each mill. This was impossible because we did not have sufficient information regarding the sales of our members, nor did we feel justified in establishing a rate until something could be done to make our membership more completely representative.

Therefore, it became necessary to fix the dues for each member at approximately the same amount which he had been indirectly paying us through his organized group and the members who have been acquired since have in turn been charged in proportion to the old members. Obviously this is an arbitrary method, unsatisfactory to those who have had this work in charge as it must be to the members themselves.

Today we are in much better position to establish a common basis. I Our membership has reached a point justifying the expectation that a rate once established would not need constant revision. I, therefore, urge that you now consider adopting the principle of a uniform basis of membership dues, upon gross sales, and that your officers be authorized to study this subject and bring forth recommendations.

To put the officers in position to act intelligently, it would be necessary for each member to acsuaint the Association with his 1926 sales and production. They could then submit a plan for the approval of the general membership and final action taken not later than the beginning of the fiscal year 1928.

Service on Foreign Patents

I assume that most of our members keep themselves closely informed on domestic patents related to the industry. I assume they also attempt to keep informed on foreign patents, I doubt that any of us keep fully posted. It should be possible, at no

great expense, to establish a clearing house at association headquarters, for both domestic and foreign patents.

There are certain services of a rather general nature now being rendered by one or another of our affiliated groups but not rendered to the industry at large. I recommend that you consider appointing a committee to study these services and to determine whether they would be beneficial to the membership of the central association and whether other similar services might be introduced.

Unless this subject is approached from a non-competitive attitude, duplication of effort and of expense can readily result. However, if the subject is approached from a purely business angle, it should be possible to prevent duplication, to extend the service to a greater number and to reduce the per capita cost.

Years ago there was some feeling that this Association was inclined to duplicate work instituted by some of our group associations. For that reason we have been reluctant to institute any service for our broad membership that had been originated by one of the smaller groups. However, I am confident that benefits may come from a study of the subject.

This afternoon we shall be addressed by a real authority on "Business Conditions as Applied to our Industry." Separate from that I wish to remind you, as I did at our last annual meeting, that when this Association was first organized, one of its principal problems was that the industry then, half a century ago, was suffering from over-production. Over-production, with the exception of a few short periods, has been the principal problem of this and every other industry. Together with the high cost of distribution it constitutes a major problem at the present time.

Our salvation depends upon obtaining basic facts, not as historical data but from month to month and week to week while the data is actually usable.

Salvation also lies in the development of new uses of our product, thus helping to keep the wheels turning full time. It lies in improved methods, higher efficiency and superior management. Let us bear in mind the tremendous possibilities as yet almost untouched in the field of research chemist and engineer. Last year, with admiration, we viewed the centralized plan of research as announced by the Canadian Pulp and Paper Association. The prospects which our Canadian friends have made must be highly gratifying to them and must command our deep respe. I again urge our members to extend their efforts individually and collectively in the research field. Splendid work is being done by the Technical Association, the Superintendents Association and the Salesmen's Association. All of these should receive our hearty support.

The Cost of Association

From time to time it has been recommended by the Executive Committee and the Secretary of the Cost Association, that the A. P. & P. A. undertake to direct and financially carry this work. The subject has been recently discussed by their Executive Committee and ours. It is claimed, and I believe soundly, that every one of our members could profit through active membership in the Cost Association. The proper alliance between them and us together with thorough group organization, would make an excellent combination. With the proper statistical knowledge of the existing total production of any grade of paper, knowledge of existing demand for the grade, of stock on hand, of the total consumption of that grade, the definite cost of producting it, and the price obtainable, any manufacturer should be able to properly determine his sales policies, eliminating the hazard of assumption.

Likewise, with this knowledge before him to determine intelligently when to invest for expanded production and when not to extend.

Without the fullest knowledge and consideration of all three of these elements, management can neither conduct the distribution of its present output with complete intelligence, nor can it properly deal with the subject of capital expenditure. I understand that a determined effort will be made to increase t he membership of the Cost Association and I recommend that we all lend our slpport to the success of this effort.

We frequently hear the American business man declare that there are altogether too many associations and that they should be decreased rather than increased. I admit that there is some justice to this opinion with re'ation to associations of a general nature. Hoowever, we are now discussing associations directly concerning our own industry and our own individual business. If the A. P. & P. A. is worthy to exist, it is because of the service it is rendering to the industry at large. If it is rendering this service to the industry at large, every producer of pulp and paper in this country, including present non-members is benefiting at least indirectly. Obviously, the benefits to the individual mill will be more pronounced when he has direct access through membership in the Association to its full services. It, therefore, becomes the duty of every such manufacturer to do his share of the work and shoulder his share of the expense. The steady increase in membership indicates that this duty and this opportunity is being recognized more and more.

If this Association becomes the powerful institution which, if properly fostered, it is destined to be, the time is coming when it will be considered a privilege rather than a duty to share in the work, and to participate in the benefits. This situation cannot be brought about over night, it means years of effort, constant improvement in policies, practices, organization and management.

I am convinced that this industry is not lacking in me of wisdom, men of initiative, men of ability, men of high ethics, who can carry this Association onward and upward, and who will do so if given the encouragemen and the support to which they are entitled.

May I say that this conviction is based upon the inspirational experiences which I have had during my connection with this Association and particularly during these last two years when you have done me the great honor to allow me to act as your chief executive.

Every least bit of loyalty and encouragement which I have wished has been extended by the other officers; by the Executive Committee; by Drfl Baker and every indipidual of his staff; by Mr. Burke of the Cost Association; by Mr. MacNaughton of the Technical Association: by Mr. Naylor and Mr. Stewartson who have participated in our Executive Committee meetings; by all of the affiliated groups; by all of the committees; by the individual members; and decidedly by our trade papers. All must recognize that the real burden of this Association is on Dr. Baker and his staff and yet there seems to have been a conviction that the elected officers and the Executive Committee were making a conscientious effort to shoulder their responsibilities, and to act only for the good of all, constantly hoping that upon this occasion when we become relieved of our responsibilities you would be satisfied that the standing and the future possibilities of the Association have not been impaired but upon the contrary that these have been somewhat enhanced.

Personally, I would not surrender a tiny part of the pleasure and the satisfaction that have come to me through your loyal support for a thousand times what effort I have put into the work.

Please believe me when I say that I very deeply appreciate every effort that has been made on behalf of the Association and the countless demonstrations of friendship which you have extended to me directly through the Association.

In spite of our best intentions I do not doubt that there must have been many occasions when criticisms seemed justified by individual members or perhaps even groups. Such of these as have come to my attention have in every case been presented with graciousness and desire to build up rather than tear down. I am sure you will find your new administration just as appreciative as we have been of your constructive criticism. You have no idea how big and indefinite this Association can seem to be when one first undertakes to direct it, and how helpless it is to obtain advice, and how relatively compact and warm hearted the Association proves to be as one becomes more intimate with it. After all, the ultimate strength of this Association will not be reached through science of organization and management so

much as through an over-expanding confidence in each other and warm hearted genuine support of the administration and the staff.

With that as a foundation and with the calibre of men whom you will select from time to time to carry on the work, the other essentials will follow as a matter of course.

I, therefore, close with the plea that you extend to the new administration and to the staff all down the line your utmost consideration and your heartiest support and in making that plea I am commissioned by the retiring officers and Executive Committee to extend our very best wishes and to prmise our full ccoperation throughout the year to come.

SECRETARY'S ADDRESS

Dr. Hugh P. Baker, executive secretary of the association, presented his annual report as follows:

The year 1927 is the fiftieth year of active work of the American Paper and Pulp Association. There has been change in the name of the Association twice since the organization meeting at Saratoga Springs in 1878 and it is conceivable that the time may come when there will be a demand for an organization, to cover all phases of the larger paper industry which might result in further change in name. But after all, what's in a name when the purpose and the men behind the purpose continue in the accomplishment of desired objectives.

Fifty years ago paper mills were very much scattered and often very much isolated. This isolation had its advantages and disadvantages. It would be interesting to trace the effect through the years of this isolation upon the development and the business of the industry. Gradually new mills were built until we have come into a period of paper mill districts, such as western Massachusetts, northwestern New York, the Miami Valley in Ohio, the Kalamazoo district, and the Appleton-Neenah section of Wisconsin. As several mills became located in the same district manufacturers gradually came together, resulting in better acquaintanceship and in appreciation of common problems and common needs. It was quite to be expected that the first appreciation of a need for organized effort should have come from the Holyoke-Springfield section, where there were a number of mills located in the 70's, and where men from the mills had been getting together from time to time.

The writing paper manufacturers of Massachusetts had formed an organization for defensive purposes as early as 1861, and there were some efforts made between 1861 and 1878 to bring larger groups together. Finally in the spring of 1878 a group of manufacturers got together in Springfield and decided that because of serious overproduction, unsatisfactory prices and harmful foreign trade, it was time to bring about a meeting of representatives of all of the mills in the eastern half of the United States. A call was sent out, signed by men like General Plunkett, Messrs. Whiting, Chapin, and others, for a meeting at Saratoga Springs in August, 1878. When the meeting was called to order by General Plunkett there was great surprise that so many representatives of mills could be gotten together. General Plunkett was elected chairman of the first meeting and on the second day of the meeting a nominating committee brought in a slate of officers, and Wm. Whiting of Holyoke, was elected first president.

It is interesting and significant that matters under discussion at the first two day meeting at Saratoga Springs are matters which are of vital concern to the industry today. With no anti-trust legislation in existence at the time there was, of course, frank discussion at the first meeting and at many subsequent meetings, of such matters as restriction of production, price cutting, harmful trade practices and destructive foreign competition. History has indeed repeated itself through the years of the Associations' activities.

The first secretaries of the Association were mill executives and for many years the secretary was an unpaid officer, and the headquarters of the Association were a drawer in an officer's desk.

There has been gradual but very great change, of course, in the character of the Association and its work for the paper industry. As is seen so often in the life of any individual or organization of individuals, the Association has had its ups and downs, strong and aggressive during one period, weak and ineffective in another period. However, over the years the Association has gradually become stronger, more representative of the industry, and more effective as a service organization.

During the first few years of the Association, while thoes who formed it were convinced that there was definite need for an organization, there was effective work carried on. In the late 80's and 90's there was a tendency for groups to get together in certain districts for discussion of the intimate problems of that group, and the annual meeting of the Association became more or less of a social affair, rather a reunion and an opportunity for contact with the trade generally. Now and then as the industry was confronted with tariff revision or some specific need there was a strengthening of the work until the specific need passed. Through all of the years of the Ascsociation, paper and pulp manufacturers, consciously and otherwise, were becoming convinced of the value of organized activities so that in the years before the Great War and during the War it was possible to get the Association onto a business basis and make it of real service to the industry.

Through many of the earlier years of the Association there was but one general organization, with different sections representing the different groups of the industry. Gradually, and for one reason or another some of the groups became dissatisfied with the central organization and separate organizations were formed. During the last ten years it has become recognized by the industry and the articles of organization of the Associatoin so direct that one of the functions of the Association is to assist in the organization of new and unorganized groups. Within the past five years, however, with the growing recognition of the need for the industry to present a united front in the larger common problems of tariff, taxation, raw materials, foreign competitions, etc., there has developed a tendency toward a stronger centralized organization. This has not meant the weakening of the affiliated organizations but rather a clearer line of demarkation bteween the activities of the affiliated organizations and the central organization, with the resultant strengthening of the central organization so that it can meet industry-wide problems in a satisfactory way.

Men Who Have Made the Industry

A book of intense interest might be written on the subject of the men who have made the pulp and paper industry of the United States. Very brief reference only will be made to the subject in this report, particularly as it will be a topic of discussion at the 50th Annual Dinner of the Association.

Any discussion of the men who have built our industry must, of necessity, be based upon a character study and an appreciation of the fact that the pioneers and the leaders, in the development of this fundamental American industry, represent a very interesting type of American manhood. The early pioneers of our industry must have been men of vision and aggressiveness, always tenacious of the idea of establishing a satisfactory business on the basic needs of an essential commdity.

Could we have known the manufacturers in our industry of 75 or 100 years ago and could we have made a character study of these men, it is very safe to assume that the type which might have been evolved from the study would be very comparable to the typical paper manufacturer of today. After all, men change but little through the years. Channels of thought and activity may be changed but qualities of humaness and originality and aggressiveness have doubtless been the same throughout the history of the paper industry in this country.

Could there be selected the typical paper manufacturer who

might represent the paper industry of the United States today it is probable that like the fathers he would show the strong influence of the geographical location of his mill, and its product. In other words, the average man in the industry is influenced by his locality, his surroundings and his product. Therefore, unless a man is above the average he may be reluctant to make himself felt in the general business life of the country. The average paper manufacturer of today is as able and aggressive as any other business man in any other national industry, and yet he often seems loath to make himself felt in the larger national and international movements with which the country is confronted. This is not a suggestion that the average manufacturer should not take care of his own business first, but rather that he has lived too close to himself and his business to appreciate the opportunity that is always present to do his share in shaping the larger policies and destinies of his state and nation.

The Association in 1926

With increased membership, making the Association more representative of the entire industry, with aggressive leadership of the officers and the executive committee, and with much better facilities within the Association for the giving of service to its membership, it is but stating a known fact to say that 1926 has been the best year of the Association. Thirty new mills have been added to the membership of the Association during the year, through the constant and aggressive assistance of the membership committee, headed by Charles A. Gordon of the Oxford Paper Company, making a total of 50 new mills during the past two years. As a number of these new mills are important factors in their particular groups of the industry, it can be appreciated that the president of the Association has accomplished an unusual service through establishing the Association as really representative of the industry. This larger and more representative membership places a very definite obligation upon the Association, to make its service of greater value to the end that membership dues paid by the mills will be considered a good business investment. This challenge your officers have accepted with the result that the past year has been a year of hard work and we believe definite accomplishment.

Confidence as between men is a fundamental factor to the carrying on of business today. Equally so, confidence among the members of the Association and by the members in the Association's officers and staff is fundamental to successful association work. Confidence between men requires more than a knowledge that a man is sound financially and that he usually lives up to his word. Acquaintanceship and understanding is a necessary factor in confidence. In an organization representing mills scattered from the Atlantic to the Pacific, and from the Canadian line to Mexico, it is not easy for the secretary and his assistants to get the acquaintanceship and understanding which is so fundamental to the development of confidence by the members in their secretary and his staff. Possibly the weakest phase of the Association's work today is the inability of members of the staff to make regular visits to the mills. It is hoped that this situation can be improved and that members of the staff may each year visit most of the mille in the different sections. An attempt to solve this particular problem has been made through the holding of luncheons in the different mill districts where the president and secretary have met the members and have presented Association activities. Luncheons have been held in three different sections the past year, but this is but a beginning and it is hoped that during the coming year the officers and the staff of the Association may be able to meet at luncheons and in other ways the member mills in each of the different regions in which groups of mills are located.

The present year has seen the development, under the direction of a trained statistician, of a strong statistical service by the Association. While the statistician was not brought into the Association until late in the year his work is already showing excellent results and there is promise of further developments in the way of monthly reports on raw materials, etc., which give promise of helpful returns to the members.

The forester in charge of the Woodlands Section has continued his surveys of different pulpwood producing sections, begun in 1925. A thorough survey, covering nearly two months of field work, has been completed in the Virginia-North Carolina section, and report on this district is ready for the printer. If arrangements can be made it is proposed to have this survey of pulpwood conditions extended the coming spring and summer to northern New England and New York. We are hopeful that the secretary of the Woodlands Section may become of greater use to individual companies in the preparation of plans for the management of timberlands, and in other ways. Certainly with the problem of a continuous supply of pulpwood one of the most vital in the industry, it should be possible to make the services of the Association's forester of greater value.

Under the definite obligation put upon the Association in its articles of organization, to assist in the organization of unorganized groups, the Association has, during the year, given exceedingly helpful service through its assistant secretary, O. M. Porter, to smaller associations which cannot employ a full time secretary, and to groups desiring to form a helpful organization. This type of service has demanded so much time of the Association's staff that during the past year it became necessary to have two of the smaller associations, namely, the American Waxed Paper Association and the National Gummed Tape Association, take on a man to give his entire time to these two organizations. The new secretary of these two organizations, Marshall C. Warwick, is now well established and there is promise of large usefulness in the work of these two groups. Upon being relieved of the secretaryship of the two associations taken over by Mr. Warwick, Mr. Porter was immediately drafted to assist in the organization of two groups which were organized formerly but which have not had an association for some years. These two groups, the glassine and waterproof wrapping paper manufacturers, have held meetings and there is promise of association development.

As one analyzes the results of association activities in the paper industry, it becomes more than apparent that it is helpful to the entire industry to have every group helpfully organized. There are still several unorganized groups and it is hoped that the Association may be helpful in bringing these groups into associations of their own. Beyond a doubt there is less satisfactory business and more unsatisfactory practices in the unorganized groups than in any of the groups which now have satisfactory association organization.

It is difficult, doubtless, for the manufacturer who is not in close touch with the work of the Association to appreciate the amount of detailed work with which the staff is confronted. In fact it may be easy to ask the question as ot what the staff is doing in New York as the weeks and months pass. It would be exceedingly helpful, not only to the staff but in the development of association work in the industry, if every member could spend an hour or two during the year in the offices of the Association to see something of the innumerable inquiries coming to the Association from its membership from the State and Federal bureaus, and from the public. It is manifestly advantageous to the industry to have these inquiries answered accurately and promptly. It would mean little to say that the Association received so many letters and sends out so many letters, and that its work takes what the staff itself appreciate as altogether too much time for detailed activities. It is a real question as to whether the staff is not spending too much time atending to necessary details in the office and too little time in visiting member mills.

A Year's Business

Business in 1926 in the paper industry has been good, generally speaking, very good. Production has been large, possibly too large in some of the groups, and profits have been fair. In his last year's report your secretary referred to the great importance

of a frank facing of the over-production problem in a way that would make for reasonable solution of the problem on a sound, legal basis. Neither the government nor any outside agency can help or interfere, over any length of time, with the normal working out of our economic problems. We must ourselves face our own problems of production, distribution, and research. As the need arises there will be outstanding leadership from among the mills and in the industry as a whole that will let us do effectively for ourselves what we need to have done.

The paper industry is far from alone in facing a difficult distribution problem. Economical and effective distribution is a fundamental phase of any year's business. Repeatedly during the past year, in discussing the business of the industry with manufacturers, the statement has been made that distribution is the weakest link in the chain. If this is a fact, it is a situation which the industry itself must meet in a practical, businesslike way. It has been proposed that the Bureau of Foreign and Domestic Commerce should make market surveys in the paper industry. As the taxes paid by paper manufacturers are used in support of every activity of government, we are justified in getting such assistance as we can from Washington. However, experience has proven that in practically every activity affecting the industry, the industry itself can do the work that needs to be done as satisfactorily and much more expeditiously than having the same work done by a governmental agency. This Association representing the entire industry more fully today than ever before, is the logical agency for the giving of any service which may be necessary in the industry. Give the Association funds to do the work properly and we are confident that results desired can be secured.

There has been but little change in the raw material situation during the past year. Pulpwood and rags have been easy and from the surveys of the pulpwood situation in two different regions we are confident that as time passes the industry will be able to solve its own pulpwood problem and that without going outside our own borders.

In referring to the year's business it would be out of place to mention the service of the Association in issuing a weekly survey of business conditions. This survey is prepared by the Association's statistician with great care and is checked carefully by the staff before being sent out. As indicated previously, we have estimated that the paper industry is spending from twenty-five to forty thousand dollars in subscriptions to various economic services which are operated on a profit making basis. We believe that both time and money can be saved the executives of the industry through the use of such an accurate statement of business conditions as the weekly survey. Unlike the numerous economic services, the Association makes no comments or prophecies of any kind in this survey but confines it to facts as we determine them from reports submitted to us by the industry, from bank letters, financial papers, etc.

Cost and Financial Service for the Association

It is a fact, borne out by evidence, that the mills generally are not making the profit which should be made from the manufacture of pulp and paper. There are exceptions, of course, and we would like to indicate our belief that the exceptions prove the rule, but this does not appear to be so. If a fair and reasonable profit is not being made then it is the business of the industry and the associations serving it to do everything humanly possible to so change conditions that fair profits may be made.

One of the important factors in meeting this situation would seem to be the determination by the industry and the associations of facts of such a character as to allow the individual mill to determine why a fair profit is not being made and how the situation within the mill can be changed. Complete and accurate statistics are a type of facts which have proven to be exceedingly helpful in making it possible for the individual mill to chart a profitable course. Sound cost accounting methods and accurate composite financial reports are being recognized in other great industries as activities and knowledge fundamental to profitable business. The industry has a Cost Association, whose work is being carried on by an able cost accountant. It is surprising that the support of this important work should fall upon comparatively few of the mills, when sound cost accounting methods and accurate information as to financial conditions are needed throughout the industry. We are hoping to make arrangements whereby the services of the Cost Association may be extended more widely among our member mills, but this arrangement can be carried out on a practical basis only as sufficient funds are made available. Certain of the groups in the industry have gone much further than others in furthering cost work and in determination of helpful financial reports. If one group can profit by this form of service it is certain that other groups can profit similarly.

What's Ahead in Raw Materials

It is difficult to say what factor in the paper industry is the most important one, that is whether raw materials, manufacture, distribution or proper financing. Of course it is perfectly evident that all of these phases or factors must be taken into consideration in successful operation. However, the foundation upon which manufacturing, and all that follows, is based, is a satisfactory and permanent supply of raw materials. There are two forms of raw material, namely, wood and cotton rags, which are outstanding and which probably never will be replaced by any of the so-called substitutes. The backbone of the supply of raw materials for the paper industry is wood.

The interesting fact that the paper industry is the only great industry in this country which has changed largely its form of raw material within a human generation has been pointed out in previous reports. There are men at this convention who can remember when ground wood and other forms of wood pulp came into general use in the industry. The very fact that we are using so generally what is really a new raw material indicates the possibilities ahead in the further refinement of this raw material. There is hardly a gathering of chemists today where the chemistry of cellulose and the possibilities of further refinement of cellulose is not discussed. The manufacture of rayon from wood pulp is a striking example of the way in which wood pulp may be brought into competition with the textile industry. There is little question but that we shall see further refinement of cellulose and that the pulp and paper industry will crowd the cotton and woolen industry seriously in the next 25 to 50 years.

Much has been said and written in the last 25 years as to the disappearing supply of pulpwood in this country. While we are cutting our forests more rapidly than they are growing yet there is a very much larger supply of timber in this country today than the most optimistic forester forecast 25 years ago. Our forests are being protected from fire, attention is being paid to forest renewal, so that growth is slowly catching up with use. It is quite possible that if the supply of pulpwood and pulp coming from outside our boundaries should be cut off our industry could go on at the present rate of production almost indefinitely. Should such a situation arise and, of course, it is not conceivable, work would be done in the protection and renewal of our forests that is not considered practical and profitable today and we would solve our forestry problem in a very much shorter time than general conditions now warrant.

The pulpwood situation today is easy though it may become more difficult as the years pass before we shall attack the problem of forest renewal on a basis that will give us a permanent supply. One has but to consider the 220,000,000 acres of forest land in the south, an area seven times the size of the State of New York, and the millions of acres of excellent forest land in northern New England, New York and the Lake States, to appreciate our possibilities in the way of wood production.

The other raw materials of prime importance to the industry, such as rosin, sulphur, clay, glue, dyes, etc., have been much less discussed than pulpwood and rags and, therefore, less is generally

known about them. Investigation of some of these last mentioned raw materials by the Association during the past year has emphasized the necessity of our having information not only as to the production of these raw materials but as to how they are used in other industries, how they are sold and how we may maintain satisfactory quality, etc. Too often in the past we have not paid especial attention to these minor raw materials until we were faced with an investigation by the Tariff Commission or by some other emergency. The Association should keep itself and the industry thoroughly informed as to all forms of raw materials and it is our purpose to begin immediately the issuance of a brief monthly report on raw materials that will indicate not only production, stocks on hand, etc., but will reflect the use of these raw materials by other industries, price trends, etc.

Financing the Association

The history and the service of the Association has been such through the past years that the problem of financing it on a satisfactory basis is, unfortunately, a real association problem. From the experience of other national associations, now well organized and financed, it is very apparent that it would be much easier for us to finance the Asscciation in a way that would be satisfactory to the industry as well as to the Association if we could obliterate entirely from the minds of the manufacturers the past history of the Association. For some years, and not so long ago, the Association was a very nominal sort of an organization, somewhat social in form, and held together apparently for the purpose of holding an annual meeting. Seven years ago, upon my becoming secretary of the Association, a startling and disconcerting fact was emphasized to me and that was that the only interest of some of the manufacturers in the Association was that it held an annual meeting. Fortunately, under the able leadership of strong executives who have served the Association as its elected officers during the past seven years, the situation hasebeen changed and it is recognized that the Association is a service organization and that it can be a profitable investment to those supporting it.

Three years ago, as the result of thorough study and hard work on the part of a finance committee, followed by action of the Association, we were able to get away from an impossible and hopeless plan of financing which never allowed the Association to know what its income would be from year to year and onto a basis that has made it possible to operate without a deficit and with a small reserve from year to year.

There is one more very definite step to be taken in putting the Association onto a sound financial basis. Representing, as we do, all groups of the industry and both manufacturers and converters, it has seemed like an impossible task to work out an equitable basis for the assessment, of dues that could be applied easily and fairly, to every mill. During the past three years a great deal of work has been done by your officers in cooperation with the membership committee in trying to fix dues to b paid by individuals mills on a fair and reasonable basis. Because of the wide diversity of the industry it is clearly impossible to fix dues upon a tonnage basis. Ine mill may be making a dozen different grades of paper with wide variation in value therefore it is manifestly impossible to fix a rate based upon tonnage for such a mill. Your present officers have given much thought to this problem the past two years and every time that the matter has been discussed they have come around to the same point and that is that the only equitable method is the assessment of dues upon the basis of gross sales. It is the opinion of your secretary that in such an industry as ours the problem of assessing dues will never be solved until they can be based upon a low percentage of gross sales.

A number of other national trade associations have struggled with the problem of financing much as we have, and have come to the gross sales arrangement. This method, applied on the basis of a reasonable minimum and maximum is the only method that is fair to all, large and small. It is greatly to be hoped that this last outstanding problem in the work of the Association may be appreciated and solved during the coming year.

There is one other phase of the financing of organized work in the industry which must be met eventually and solved on a sound economical basis. With the very moderate income under which the Association is working, which is very carefully budgeted by the executive committee, it is impossible to finance emergency activities as they arise in the industry. The result of this has been that if a special piece of work became necessary a special committee was appointed and a special appeal made to the industry for support. This is neither economical nor efficient because it immediately increases overhead costs in organized activity and is annoying because it means meeting repeated calls for funds by the executives. In a billion dollar industry such as ours it should be possible to give the central organization of the industry sufficient funds not only to carry on such necessary work as may be decided upon by your representatives on the executive committee, but a reserve of sufficient size to meet every emergency activity. If the central organization is not organized in such a way as to take care of these emergency activities, then it is time that the membership take matters in hand and see that there is an organization able to take care of every piece of work that needs to be done.

The Association Program for 1927

It has been the aim of the officers and staff of the Association during the past seven years to put before you from year to year a definite program of work. From our standpoint it is difficult to conceive of a going organization such as we have tried to make of the Association without a definite program of activities.

Strange as it may seem to you as business men, it was a difficult thing for your secretary when he came in the organization in 1920 to find what the program of the Association was at the time and what its objectives. Repeatedly the statement was made to him by executives that they did not know what the Association was doing and they might well have added, what the Association was for. This is in no sense a reflection upon the Association in the past, but rather an indication of our strong belief that the Association's membership should know its program and what it is seeking to accomplish from year to year. It has been the constant aim of your secretary to inform the members of the program of the Association, what it is doing and what it is accomplishing. This has been done through the printing of leaflets and booklets, through the holding of sectional luncheons, and through personal contact.

It has been very difficult to outline a definite program of work of recognized helpfulness to the mills and put such a program into effect both because of the feeling in the industry that the Association deals only with large general problems, and because of the fact that these general problems are not often of direct and vital importance in the daily activities of the executives. It is much easier to show results in a program dealing with the intimate, business activities of the executives than a program covering the larger, more general problems of the industry, as vital as these may be. It has apparently been very difficult at times for the members to appreciate the fact that small economies, effected in a given operation in a mill; in the purchase of raw materials or supplies or in other ways may be entirely wiped out by an action coming out of these so-called general problems such as some adverse ruling by the Federal Income Tax Bureau or of some other action from the outside yet the Association has a program which is being carried out as aggressively as possible.

A truism, almost out of place here, is the old saying that a man gets out of an organization only what he puts into it. We are rather generally agreed that the man who complains that he is getting nothing out of a business or social or religious organization is the man who is putting nothing into it. Is it out of place to emphasize the fact that a business man will get little or nothing from his trade association unless he uses it? By your financial support you have built up a series of machines in the paper in-

dustry, in the form of trade associations. Are you getting the efficiency and production from these machines which you have a right to expect? As we observe and study the workings of our trade associations and those serving other national industries, we are constantly surprised at the amount of available information at the helpful contact, and at the opportunities for service, which are in fact frozen capital. What the associations have is yours for the asking. The secretaries of your associations are working constantly for the same end which you are seeking, and that is profit and permanency in the industry. We beg you to make use of your associations.

As now organized, under the leadership of the eight able and representative men whom you have put upon your executive committee, the Association is in better position than ever before to give direct, helpful and profitable service along the following lines: 1. Statistics. General for the entire industry and special for groups. Emergency statistics-available to every member. 2. Information. Upon any question affecting the industry,—available to members, to the industry and to the public, where it is helpful to the membership to serve the public. 3. Legislation. 4. Committee Activities. The Association's Committees on Taxation, Tariff, Distribution, New Uses, etc., are always ready to work—with your assistance and at your demand for work. 5. Foreign Contacts. 6. Woodlands Section. 7. Arbitration. 8. Conventions and groups meetings. 9. Technical and Merchandising research. 10. Emergency service.

Active work by the Association along lines indicated above is indeed a program. We want you to know the program and help us to make it an effective one for the industry.

For 1927 it is the aim of the Association to continue its present activities ,without spreading itself too thin, and to add, if funds allow, service along the following lines: 1. Development of Foreign Trade. 2. Engineering Service—to meet the stream purification problem and similar problems. 3 Cost and Financial Service. 4. Assistance to the Technical and Superintendents' Association in apprenticeship Training. 5. Trade Promotion and Cooperative Advertising.

Perhaps the program is too ambitious, yet those of us who are working with you in the Association are so constantly in touch with the needs of the industry that we think we can see clearly the vital importance of every item referred to in the above program. It might be easy in one sense, though not at all easy for your staff, to sit back and mark time until there is overwhelming demand for a certain form of service before it is undertaken. We do not interpret our service to you on that basis. If the secretaries of your association cannot have an industry-wide vision of conditions in the industry, and if they do not have somewhat of the elements of leadership, they should be replaced by men who do have some vision and some elements of leadership.

Better Business Ahead

The celebration of the Fiftieth Anniversary of the Association is indicative of the belief of paper manufacturers through the years that it is helpful to work together in trade associations. The trade associations in our industry have brought friendship and understanding and confidence. The confidense which you have in each other and in your assocition is making for stability in the industry. Stability means better business ahead.

You will hear this afternoon, doubtless, in the discussioon of the topic, "General Business and the Paper Industry in 1927" of the factors that are making for sound business in this country, and therefore better business ahead. It would be out of place for me to even refer to these various factors at this time. American business is sound and whatever elements of understanding and the help which will come through the organized efforts of our associations that we shall continue to produce more and better paper, and let us all hope with profit.

Good business ahead means more efficient manufacturing, more attention to research of the right character, better training of the men who are to do our skilled work, and of the men in our offices, better understanding of distribution and more knowledge of the factors which influence the progress of business in this country. We have made great progress in all of these things, as we have made progress in our association work, but there is very much yet to be done and is there anyone in the industry, who is thinking soundly of these various elements of our important business who will not agree that we can do more organized attack than by following a policy of isolation.

Better business will come to our industry as the unorganized groups of the industry get together for the profitable association work that is already being carried out by a number of the groups, and a step further when all of the groups unite to present a united front, through the American Paper and Pulp Association in waging the contest which we shall always have in meeting undesirable trends in our social, political and business life. Better business ahead depends not only upon the efforts of the individual in the office and in the mill by a reasonable projection of his efforts into unified action that will make for the benefit of the industry as a whole.

Associations Officers and Staff

It is significant and yet logical that you are able to command the services of the men whom you elect as your officers and Executive Committee. As the executive committee is now organized, and as the work of the Association has developed, election to the committee is not a mere honor, but rather a strenuous obligation. It is in place for your secretary to emphasize the high character of service which you have received from your elected officers and members of your executive committee during the past year. It is not an easy thing for a busy executive to take on the duties imposed by service on the executive committee of the Association, yet only as executives of the industry appreciate and respond to the obligation to serve the industry will the Association do the work which you expect of it and will the industry make reasonable progress.

It has been a privilege and an inspiration for the staff of the Association to serve during the past year under President Wilson. No executive in the industry who has not been close to association work can appreciate the time and thought demanded of the president and members of the executive committee. The Association and the industry owe a real debt to Mr. Wilson and the other elected officers for the way in which they have given freely of themselves this past year.

What the Association accomplishes for you and for the industry in the years ahead must depend, after all, upon what you wish it to accomplish and what you will give toward accomplishment. Your officers and the staff of the Association can but assist is making the Association what you expect it to be. If you are willing to meet the president and executive committee, as well as the secretary, just a little more than half way in what they are trying to do for you, we are confident that the Association can be made an organization of which you can be proud and an agency of definite assistance to the progress of the industry.

THE PAPER INDUSTRY FOR 1927

John C. Howell, vice president of the Brookmire Economic Service, Inc., delivered the following address in part was "General Business Prospects and the Paper Industry for 1927."

At the beginning of each year, and growing apace, much news print is consumed in giving to the world the facts, opinions, expectations, estimates and forecasts of business prospects by men in high places in manufacturing, merchandising, transportation and banking, and in many other fields. This practice furnishes conclusive evidence that American business has reached an era of forward looking executives.

The beginning of the year furnishes a good place in the calendar for this indoor sport, but there is no more reason why this should be done in January than in June or October. In fact, the best conducted, and therefore the most successful, business is doing this all the time. This practice also furnishes evidence that American business is now more concerned with eco-

nomic law and its effects than ever before. This, to a large extent, is a guarantee that unsound economic conditions should never again creep into our business operations without being detected early enough to avoid disastrous consequences.

On recognition of economic trends, measures could be taken to nullify the efforts of movements which would lead to an unhealthy boom resulting in collapse. This has been proven in recent years by the careful control of unlimited credit resources, avoiding, on the one hand, the waste of idle funds and the menace of inflation. On the other hand, it has operated to prevent wild and unreasonable speculation in commodities, stocks and bonds, real estate and building. Where speculative tendencies were developing, especially in the field of real estate and building, wise counsels, aided by sharp warnings, checked these tendencies before general disaster resulted.

It has operated to prevent excessive building up of inventories by manufacturers to the point which required exceptional use of bank credits, and the maintenance of a nice balance between the production of goods and the demand therefor, which has been characteristic of industrial operations for some years. It has operated to keep merchants from pyramiding orders, a practice which always presages cancellation.

Hand to mouth buying has proven a blessing in disguise. Large sales and rapid turnover through retail channels have been characteristic of business during the last few years, and have not been the handicap to manufacturers or transportation companies which was expected when this practice was first put into effect. On the contrary, it has proven a distinct benefit to all concerned throughout the process of production, from raw material producer to consumer. We are always in less danger when we post the sentinel than when we neglect to do so.

The policy of conducting business along sounder economic lines has not only been the basis of our recent prosperity, but a continued observance of such a policy is a guarantee of sustained prosperity.

There can be little question that the same intensive watching is now in evidence and makes the industrial situation fairly secure from the dangers of a boom expansion or drastic liquidation. Avoiding the one, we avoid the other.

Business under prevailing conditions is clearly in between the boom status and the liquidation status, and there is no particular reason why we should have a boom from the present level any more than we should have a liquidation. Here I wish to distinguish between the terms "liquidation" and "recession."

The question then is, can we maintain the present balance between supply and demand, and progress at a normal rate of growth during 1927; or, has the recent pace been too fast, and must we have a moderate recession in this pace to preserve the healthy balance now existing?

My judgment is that a moderate recession in the first six months of 1927 is likely, which would clear the atmosphere and set the stage for better conditions in the second six months. This opinion is based on an examination of the following important industries in the field of production and other affecting factors.

Now in view of the background outlined, where does the paper industry stand? Your industry is not only well integrated and managed, but stands in the forefront in economic leadership. You have, more or less, an exclusive product—although varied in character—as well as an exclusive field. It is necessary, I think, to cultivate this field more extensively by finding new uses for paper. It is necessary to abandon antiquated methods which have no virtue but age, and adopt new methods and machinery as they are developed, which make for saving in cost, larger profits, increased wages and lower selling prices.

You should avoid overproduction as you would the plague, for this is the bane of prosperity. This can be done through cooperation, coordination, and an industry consciousness not yet overdeveloped.

This industry esprit du corps safeguards your prosperity and sets an example to other industries, places less stress on profits per se as the index of success, and more on service, which amplifies profits through good will.

The paper industry has, in my opinion, always been forward-looking, less dominated by the business cycle, more in harmony with economic law than any other, and successful operation necessitates the maintenance of this harmony as much as it ever did.

If general business is to be good, you will profit as much as any. If depressed, you will suffer less than many. If static, you will more than hold your own.

The general background, or foreground if you will, indicates a good business year ahead. You should make your normal growth in expansion, but I doubt if business conditions will be sufficiently good to justify higher expectations.

There will be as good a demand for news print through sustained advertising, book, writing, bond, board and other staple grades as in 1926, but novelties and quality grades offer a field for less sales resistance and larger profits.

RESOLUTIONS

The following resolutions were passed by the American Paper and pulp Association at its general meeting on Thursday:—

SCANDINAVIA

WHEREAS, The problems of Pulp and paper manufacture here and abroad are very similar, and

WHEREAS, Much is to be gained by frequent personal contacts between the leaders of the industry here and abroad, and

WHEREAS, During recent years executives of the American industry and officers of the American Paper and Pulp Association have been most cordially received by the Norwegian, Swedish and Finnish pulp and paper associations and their individual mills, and

WHEREAS, Definite invitation has been received from the Scandinavian associations for informal conferences to be held in Sweden and Finland this coming summer between the executives of the American and Scandinavian pulp and paper industries,

BE IT THEREFORE RESOLVED, That the Association expresses its appreciation of the friendly relations existing between the industry of this country and that of Sweden, Finland and Norway, and recommends that the invitations from the Scandinavian associations be accepted and a representative delegation of American pulp and paper manufacturers attend such conference as representatives of the American Paper and Pulp Association and the American paper industry, in order to discuss such problems as may be of mutual interest.

IN MEMORIAM

WHEREAS, In the wisdom of Almighty God, leaders of the industry have been taken from among our Councils during the past year, be it therefore

RESOLVED, That the Association voices its sorrow at their loss, and its appreciation of their constructive work for the industry: Walter Alexander, Marathon Paper Mills Company; Winford N. Caldwell, American Writing Paper Company; Clarence W. Collins, Cherry River Paper Company; Austin H. Dwight, Hawthorne Paper Company; Augustus W. Esleeck, Esleeck Paper Company; Chester Wolcott Lyman, International Paper Company; Francis N. McCrae, Brompton Pulp and Paper Company; Albrecht Pagenstecher, Pioneer in pulp and paper industry; William Ridgway, National Paper Trade Association; and others.

VOCATIONAL TRAINING

WHEREAS, The American Pulp and Paper Mill Superintendents Association has been taking a very active part in the development of Vocational Education, Foremanship Training and other educational features among the men in the Pulp and Paper mills of the United States, and

WHEREAS, The work of getting this type of training before the Mill Owners and Managers has been carried on in several different paper making districts during the past year, and has met with partial success, due to the cooperation of the mills recommending it to their employees, and

WHEREAS, The American Paper and Pulp Association is heartily in accord with this work, be it therefore

RESOLVED, That the members of the Association make an effort to further this cause of education by giving their moral and financial support to this work as promoted through the Superintendents Association and other affiliated organizations of the paper industry.

STATISTICS

A resolution authorized the president of the association to arrange for a series of meetings of the statisticians of the industry with a view to determining statistical standards, classifications, definitions and practices applicable to the statistical needs of the pulp and paper industry.

CANADA

A resolution recorded the appreciation of the association of the goodwill evidenced by the Canadian Pulp and Paper Association and its desire to develop the most complete and harmonious cooperation between the paper associations and industries of the two countries through their Joint International Committee.

PREPAREDNESS

A resolution expressed the desire of the association to cooperate with the War Department in compiling the necessary data as to productive capacities, grades, etc., which can be used by the Department in preparing a table of the nation's requirements for pulp and paper for the first twenty-four months of any national emergency, and authorizes the appointment by the President of the Association of a permanent War Service Committee under the leadership of Colonel Fletcher.

NORMAN W. WILSON

A resolution expressed the appreciation of the association of the painstaking, untiring and constructive efforts of President Norman W. Wilson and the other officers of the Association in developing an effective instrument for the protection, promotion and perpetuation of the paper industry of the United States.

VOCATIONAL TRAINING

A resolution placed the association on record as endorsing the principle of the practice of forestry by the private timberland owner in order to insure continuous forest production and an adequate supply of raw materials for the pulp and paper and other wood using industries.

A resolution pledged the association to urge the passage of this bill in order that effective co-operation between the research agencies of the State and Federal Governments and the wood-using industries may be developed for the prompt solution of problems of fundamental research and forest practice.

WOODLANDS SECTION

The Woodlands Section of the American Paper and Pulp Association had a very busy time on Wednesday, with all day sessions, and an informal dinner at 7 in the evening. Those who attended were rewarded by hearing a number of exceptionally interesting addresses, covering the entire scope of the section's activities.

One of the most instructive papers was presented by Samuel T. Dana, director of the Northeastern Forest Experiment Station, on "Growing Spruce for pulp wood in the North East." Mr. Dana stated that during the past three years the Northeastern Forest Experiment Station has devoted considerable attention to determining what results have followed cutting on spruce lands and also what yields may be expected from fully stocked, even aged stands of spruce, such as are characteristic of many old fields in the region.

This work has been handled chiefly by M. Westveld and W. H. Meyer, and has involved the establishment in Maine, New Hampshire, Vermont, and New York, of over 400 temporary sample plots on areas cut over from two to fifty years ago; and of approximately 200 plots in even aged spruce stands varying from 25 to over 100 years of age. This paper was based on the information obtained in connection with these studies so far as this has already been analyzed.

"Pulp Wood Prospects in the Southern Appalachians" were thoroughly described by E. H. Frothingham, director of the Appalachian Forest Experiment Station. Mr. Frothingham pointed out that because of the abundance of the southern pines, the greatest progress in the southern field has been through the manufacture of sulphate pulp, kraft paper, and paper board.

In 1924, when this branch of the industry was only 16 years old, southern mills consumed 370,000 cords of southern yellow pine. Since 1920, stated Mr. Frothingham, sulphate mills have increased from 9 to 13, and soda mills from 6 to 9. In the same period ground wood mills have decreased from 7 to 4 and sulphite mills from 9 to 5.

Mr. Frothingham sketched briefly the general timber situation in the mountains, with reference to availability for a continuous pulp wood supply. He declared that physical conditions for manufacture are excellent in many well-timbered parts of the Southern Appalachian region. The failure of other pulp manufacturing processes to expand in the mountain region on a par with the sulphate process in the coastal plain can be attributed largely to the fact that the hard wood species suitable for pulp products are not closely concentrated, but usually occur mixed with other hard woods, which have been regarded as of little or no value for pulp.

Raphael Zon, director of the Lake States Forest Experiment Station, University Farm, St. Paul, Minn., gave a comprehensive address on "The Problem of the Pulp Wood Supply in the Lake States," including Michigan, Wisconsin and Minnesota. After an exhaustive analysis of the available supply of the principal species used for pulp wood and paper manufacturing, comprising spruce, hemlock, balsam fir, jack pine, popple (aspen), and tamarack, Mr. Zon declared that the fate of the industry is largely in the hands of the pulp and paper men themselves. He concluded his remarks with the following statement:

"The pulp and paper mills, especially those which own their own forest lands, are confronted with the alternative of either handling their forest land as a renewable resource, providing a continuous and ample supply of pulp wood at a reasonable cost, removing the increasing difficulties and cost of obtaining raw materials, or allowing the land to become idle waste and exposing themselves to the hazard of seeking raw materials in distant markets in competition with other wood-using industries. Which will they choose?"

During the proceedings the members of the Woodland Section endorsed suggestions for reorganization by the American Paper and Pulp Association, as follows:

"At the time the Woodlands Section of the American Paper and Pulp Association was organized, the set up of the parent association was not on the same basis as at present, memberships being through affiliated associations instead of direct, as now. This was one of the reasons for organizing the Woodlands Section as a semi-independent body depending upon direct membership dues for its support.

"With the change in the organization of the parent association, membership in it automatically included membership in the Woodlands Section, and the Woodlands Section at the same time retained its outside classes of active and associate members paying dues of $10.00 and $5.00 per annum, respectively.

"The Woodlands Section is today a service bureau of the American Paper and Pulp Association, devoted to problems connected with pulpwood supply. The suggestions following are

offered for the purpose of bringing the organization of the Woodlands Section into line with its actual status at present.

"1. It is proposed that instead of an elected executive committee, the Woodlands Section should be governed by an "Advisory Committee" of eight members, appointed by the President and Executive Secretary of the American Paper and Pulp Association, representing the following geographical divisions: New England, New York, Middle Atlantic, South, Ohio and Mississippi Valley, Lake States, and Far West, together with the executive secretary of the American Paper and Pulp Association as an ex-officio member.

"It is further suggested that one member of this Advisory Committee should be a member of the Executive Committee of the American Paper and Pulp Association. This to provide for continuously close contact between the governing body of the parent association and that of the Woodlands Section.

"2. With this change in effect it is suggested that membership in the Woodlands Section be made up of three classes as follows:

"(a) Active members.—One or more representatives from each member mill of the American Paper and Pulp Association. Every member mill, whether a manufacturer of pulp or not, to have one representative. Additional representatives for mills manufacturing pulp based on the annual pulpwood consumption. The number of such additional representatives to be decided by the Advisory Committee.

"(b) Associate members.—It seems desirable to continue the opportunity for memberships for those who are interested in the work of the Woodlands Section and who are not eligible through employment by members of the American Paper and Pulp Association. This membership would include foresters, woods managers and others, approved by the Secretary and the Chairman of the Advisory Committee. The dues of such members to be set by the Advisory Committee.

"(c) Complimentary members.—It has always been our custom to carry certain outstanding foresters and others as complimentary members. t is suggested that this practice be continued and that such complimentary members be designated by the secretary and the chairman of the advisory committee. At the present time the directors of several of the Forest Experiment Stations and other government and state foresters from whom we obtain much valuable information are complimentary members."

REPORT OF IMPORT COMMITTEE

Concrete figures as to the accomplishments and activities of the Import Committee of the American Paper Industry, together with a detailed report of various problems considered during the year, present a most graphic picture of the value of the work of the Committee to the paper manufacturers of the United States.

When the United States Customs Court began its summer recess July 1, 1926, there were pending trial 619 protests involving classification and 223 involving under-valuation. In addition there are scores of protests by importers against customs appraisers' rulings which had not at that time been formally docketed for trial.

But the work of the Import Committee has not been alone the prosecution of cases in which the importers think they have reason to appeal to the courts. In many hundreds of instances the importers have accepted without protest the rulings of the appraisers as to classification and value of foreign paper. It is impossible to give the total number of these reclassifications and advances in value, as these are matters strictly between the importer and the customs officials. It is probably safe to say, however, that there have been at least 1,000 importations found to be wrongly classified or undervalued where the situation had been rectified without recourse to the customs courts.

In other words, the Import Committee's activities have been responsible not only for the prosecution of cases in court, but in preventing violation of the letter and spirit of the tariff act, as regards paper.

In the Annual Report presented to subscribers a year ago, it was shown that the Import Committee had investigated 161 cases of suspected violation of the Tariff Act. This seemed a large number. But the year just closed proves that this work of the initial year of the Committee's formal life was only a beginning. During the past year there have been 504 investigations conducted by the Committee, together with further work on cases initiated the preceding year. And there seems to be no cessation of the number of problems coming before the Committee for investigation or action. These cases often involve a large number of importations; for instance there are 105 importations involving undervaluation of rotogravure paper from Germany, which are listed by the Committee as a single "case."

The most important single development of the Import Committee's year was its extension of its work abroad, originally planned, but not inaugurated until the funds available warranted, and until the situation on this side of the water was better in hand. A foreign office has been established, with an experienced man in charge, whose chief duty is to maintain constant watch on foreign paper prices, so that improperly valued shipments may be checked at the source, instead of waiting until the foreign under-valued paper has actually arrived in this country and the damage of unfair foreign competition has been done. This work is still new, and it is impossible as yet to give results in statistical form. However, it is evident that the evil of undervaluation is no less prevalent than that of misclassification. At present the ratio of misclassification cases to undervaluation cases is as three to one.

This foreign activity means additional expense, but the subscribing mills have provided funds sufficient to begin the work, and the Committee proceeded to inaugurate the foreign service in the belief that the work of the Import Committee must be done thoroughly, if at all. It would seem that every paper manufacturer in the United States should be only too glad to do his share toward elimination of foreign low prices and unfair competition.

MEETINGS OF COST ASSOCIATION

The seventeenth semi-annual meeting of the Cost Association of the Paper Industry was held at the Waldorf-Astoria on Tuesday and Wednesday. On Tuesday morning Reed B. Timmers, of Albany, N. Y., gave an instructive address on "Insurance Information," including workmen's compensation insurance, which was greatly appreciated by the members present.

D. A. Wilcox, cost accountant of the Oxford Paper Company. New York, addressed the gathering on "Paper Machine Efficiencies," and described the system used by the Oxford Paper Company to check up the operating efficiencies of its paper machines in a very comprehensive manner. He impressed the importance of obtaining the trends and comparing the efficiency of today with past performances and declared that this can be done with any reasonable base so long as you use the same one constantly.

In the afternoon a luncheon meeting was held, an account of which appears on another page of this issue. At a later session. H. R. Boston, cost accountant of the Stevens & Thompson Paper Company, of North Hoosick, N. Y., spoke on "Our Standard Cost System."

An illuminating address on "The Use of Statistics for Budget Purposes," was given later by Paul S. Hanway, statistician of the American Paper and Pulp Association. Mr. Hanway stated that the business budget is a comparitively modern innovation, although budgets have been prepared by governments for controlling public expenditures for many years. Unfortunately the public budget cannot be said to be in general use, although those concerns which have adopted the budget system are among the most progressive in the country.

"The budget is a statement prepared from estimates for a definite future period," said Mr. Hanway, "of the expected operations in each department of a business. The forecast for each department is dependent upon the anticipated activities of all other departments, as for example: a manufacturing program must be based upon anticipated sales, and the estimate of sales must

be limited naturally by the productive capacity of the mill. Estimates from all departments are combined, to show a statement of cash receipts and expenditures, and estimated profit and loss statement and a balance sheet, as it will appear at the end of the budget period.

"These three statements make up a tentative budget, which is submitted to the heads of the business for revision and approval, and it is for them to determine the volume of sales which in their judgment ought to shape the company's financial policy for the forthcoming period. The entire budget must be based on the policy then decided on. Standards of performance are established for operating departments, while limits of expenditure are placed on others. Costs both for operating and extensions are carefully compiled and adjusted, until finally a budget is compiled, which is approved by the executive head.

"There are any number of nationally known economic and statistical services issuing reports on various phases of general business. It is because so few of these statistical and economic services bring these general statistics into focus on the particular needs of any single industry, that the American Paper and Pulp Association has of late been publishing weekly for its members a condensed summation of the most pertinent of the statistical and economic happenings in general business bearing on future consumption of paper and pulp."

A short business session was held on Wednesday morning, followed by open meetings throughout the day, until 5 p.m., when the meeting ended.

PAPER SALESMEN'S ASSOCIATION

The annual meeting of the Salesmen's Association of the Paper Industry on Tuesday was well attended.

Following routine business, J. R. Buckley, of N. W. Ayer & Sons, one of the largest advertising agencies in the country, gave an address on advertising, covering phases of interest to the paper salesmen.

The following officers were elected for the ensuing year:

President, James H. Coy, Flambeau Paper Company.

Vice Presidents—New England Division, George J. Cadwell, American Writing Paper Company. New York Division, Charles W. Nickenig, Canadian Export Paper Company. Miami Valley Division, Colin Gardner, Gardner and Harvey Company. Chicago Division, Walter J. Cox, Paterson Parchment Paper Company.

Executive Committee, the above officers, and R. T. Houk, Jr., G. H. Mead Company; F. W. Main, Worthy Paper Company Associates; J. E. A. Hussey, International Paper Company, and Dr. Hugh P. Baker (Ex-officio) American Paper and Pulp Association.

Chairman Membership Committee, R. T. Houk, Jr. Chairman Educational Committee, F. W. Main. Chairman, Social Committee, J. E. A. Hussey. Secretary-Treasurer, D. A. Crocker, 18 East 41st street, New York.

GLAZED PAPER ASSOCIATION

The Glazed and Fancy Paper Manufacturers Association held their annual meeting and luncheon at the Canadian Club, Hotel Belmont, on Wednesday afternoon, twenty-five members attending.

The following officers were elected: President, R. N. Fowler, Hampden Glazed Paper and Card Company, Holyoke, Mass.; Vice president, A. S. Guggenheimer, United Manufacturing Company, Springfield, Mass.; Treasurer, John Van Horn, Holyoke Card and Paper Company, Springfield, Mass.; Secretary, O. M. Porter, 18 East 41st street, New York.

Executive Committee—the above officers, and Jesse Linton, Pawtucket Glazed Paper Company, Pawtucket, R. I.; W. G. Snow, Middlesex Products Company, Boston, Mass; I. O. Van Duzer Louis DeJong & Co., Staten Island, N. Y.; C. W. Walther Walter & Co., Inc., New York.

TISSUE PAPER ASSOCIATION

The Tissue Paper Manufacturers' Association held its annual election Tuesday morning, electing the following officers for the ensuing year:

President, Z. W. Ranck, Crystal Tissue Company; Vice-president, J. M. Conway, Hoberg Paper and Fibre Company; Vice-president, John M. Rieg, Erving Paper Company; Secretary-Treasurer, E. H. Naylor.

Executive Committee, Z. W. Ranck, Crystal Tissue Company; J. M. Conway, Hoberg Paper and Fibre Company; John M. Rieg, Erving Paper Company; E. H. Benson, Regal Paper Company; E. J. Kiefer, Port Huron Sulphite and Paper Company.

The meeting was well attended and the members engaged in an unusually interesting discussion of trade conditions and problems of intimate concern to the tissue business.

WRITING PAPER ASSOCIATION

The Writing Paper Manufacturers' Association held its annual meeting, Wednesday forenoon, when the following officers were elected for 1927: President, W. M. Crane, Jr., Crane & Co., Dalton, Mass.; First Vice President, D. K. Brown, Neenah Paper Company, Neenah, Wis.; Second Vice President, F. A. Leahy, Eastern Manufacturing Company, Bangor, Me.; Secretary-Treasurer, E. H. Naylor, Springfield, Mass.; Executive Committee, L. C. Anderson, W. B. Oglesby Paper Company; D. K. Brown, Neenah, Paper Company; W. M. Crane, Jr. Crane & Co.; I. N. Esleeck, Esleeck Manufacturing Co.; A. C. Gilbert, Gilbert Paper Co.; F. A. Leahy, Eastern Manufacturing Company; S. L. Willson, American Writing Paper Company.

In point of attendance and in general interest, the meeting was one of the most successful the association has ever held.

BINDERS BOARD MANUFACTURERS

The Binders Board Manufacturers' Association held their luncheon on Thursday noon at which time the officers which have served during the past year were all re-elected. They are:

President Leigh H. Davey, the Davey Company, Jersey City, N. J.; Vice president, Edward Kerr, Jr., Kerr Paper Mill Co., East Downingtown, Pa.; Secretary, O. M. Porter, 18 East 41st street, New York; Treasurer, A. B. Goodrich, Riverside Paper Manufacturing Company, Glastonbury, Conn.

Executive Committee: E. O. Betz, Consolidated Paper Company, Monroe, Mich.; E. H. Norton, C. H. Norton Company, North Westchester, Conn.; J. T. O'Brien, Otter River Board Company, Otter River, Mass.

GUMMED TAPE MANUFACTURERS

The National Association of Gummed Tape Manufacturers elected the following officers at their anual meeting at the Waldorf-Astoria on Wednesday afternoon: President, Irving McHenry, Mid-States Gummed Paper Company, Chicago, Ill.; Vice-president, E. C. Smith, Nashua Gummed and Coated Paper Company, Nashua, N. H.; Secretary-treasurer, M. C. Warwick, 18 East 41st Street, New York.

Executive Committee—The above and L. A. Bassett, McLaurin-Jones Company, Holliston, Mass.; W. K. Gerbrick, Central Paper Company, Menasha, Wis.; W. A. Wylde, Liberty Paper Company, Bellows Falls, Vt.

WATERPROOF ASSOCIATION PLANNED

A waterproof wrapping paper manufacturers organization committee was formed on Monday at the American Paper and Pulp Association's convention headquarters in the Daldorf. A. F. Schenkelberger, of the Safepack Mills, Millis, Mass., was chosen chairman of a committee to draft trade customs, articles of association, and standardization recommendations. Ten manufacturers participated in this preliminary meeting and arranged to reconvene in Buffalo on March 22, where they expect to complete the organization of the Moisture and Waterproof Wrapping Paper Manufacturers Association.

COVER PAPER MANUFACTURERS

The Cover Paper Manufacturers' Association held its annual meeting Tuesday afternoon, when the following officers were elected for the ensuing year:

President, Minor M. Beckett, the Beckett Paper Company.

Vice-president, Colonel B. A. Franklin, Strathmore Paper Company.

Secretary-Treasurer, E. H. Naylor, Springfield, Mass.

Executive committee, Minor M. Beckett, Colonel B. A. Franklin, and Willis H. Howes, Knowlton Brothers, Inc.

U. S. PULP PRODUCERS ASSOCIATION

The United States Pulp Producers Association held its annual election of officers at the Waldorf-Astoria on Tuesday, when the following were elected for the ensuing year:

President, L. M. Alexander, Nekoosa-Edwards Paper Company, Port Edwards, Wis.

Vice-president, W. H. Savery, Shenandoah Pulp Company, Harpers Ferry, West Virginia.

Executive committee, Norman W. Wilson and J. M. Ward.

Secretary-Treasurer, O. M. Porter, 18 East 41st street.

CONGRATULATORY MESSAGES

Among the congratulatory messages received by the American Paper & Pulp Association on its fiftieth anniversary were radiograms and cablegrams from the following officials of foreign associations and others:

Jahns Sandels, Managing Director of the Swedish Paper Mills Association; Dr. Opfermann of Berlin, Germany; H. B. Peterson and E. Jordan of Hanover, Germany; Swedish Cellulose Association; Central Association of Woodworking Industries; Zellstoffabrik Waldhof.

BRISTOL BOARD MANUFACTURERS

While the Bristol Board Manufacturers have no association they usually make it a point to hold an informal meeting during the week of the convention of the American Paper and Pulp Association. They held such a meeting, Wednesday forenoon, when a good representation of the manufacturers engaged in a general exchange of ideas on various problems which they are called upon to meet.

CONVERTING MILLS ASSOCIATION

The Converting Paper Mills Association met on Tuesday morning with a good representation of its members. During a short session various matters of interest to the association were talked over. The association does not elect officers at this time of year.

CARDBOARD ASSOCIATION

At the meeting of the Cardboard Manufacturers' Association held on Wednesday, officers were elected as follows: President, Donald Lowe; Vice President, Carl Schneider; Treasurer, H. W. Suter; Secretary, Kendall Wyman; Executive Committee, Donald Lowe, Lowell Emerson and Raymond Bee.

Various matters of trade interest were debated and the meeting proved one of more than ordinary interest.

WAXED PAPER ASSOCIATION

The American Waxed Paper Association not only held their scheduled meetings but also several added sessions. Its entire membership with one exception was present. The election was deferred until Thursday when the following were elected: President, Arthur Havemeyr; Eastern Vice President, A. W. Moore; Western Vice President, C. F. Wright

Executive Committee: W. L. Carter, J. Kindelberger, W. J. Eisner, George H. Gardner and R. B. Donnelly.

STANDARDS FOR TISSUE PAPER

On Wednesday afternoon there was a joint conference of the National Paper Trade Association, the Tissue Paper Manufacturers Association, and the United States Department of Commerce, represented by H. R. Colwell, when the standards for tissue paper adopted March 31, 1926, were reaffirmed, and will apply for the ensuing year.

SOUTHERN KRAFT ASSOCIATION

The Southern Kraft Manufacturers Association met at the Waldorf-Astoria Hotel on Monday and Wednesday. There was a full attendance of members. Numerous matters of interest to the industry were discussed. The conditions which prevail at present were reported to be excellent while the future outlook was considered to be very bright.

WRITING PAPER DIVISIONS

Following the general meeting of the Writing Paper Manufacturers' Association on Wednesday, the Fine Paper Division and the Sulphite Bond Divisions held separate meetings. The members of each division greeted their new official heads which were elected at the general meeting and then turned their attention to various matters of trade concern.

WRAPPING PAPER MANUFACTURERS

The Wrapping Paper Manufacturers Service Bureau met in the Tea Room of the Waldorf-Astoria on Wednesday morning and afternoon, when statistics of the industry were discussed, and vital business matters were thoroughly thrashed out.

TOILET PAPER CONVERTERS

Thhe Toilet Paper Converters Division of the Tissue Paper Manufacturers Association met at the Waldorf-Astoria Hotel on Tuesday afternoon and discussed various business matters of interest to the organization.

SHEET TISSUE DIVISION

A meeting of the Sheet Tissue Division of the Tissue Paper Manufacturers was held at the Waldorf-Astoria Hotel on Tuesday afternoon, when many matters pertinent to the industry were freely discussed.

WESTERN BOARD CO. EXPANDS

The Western Board and Paper Company will increase its capacity by the installation of a 68 trim cylinder machine for the manufacture of light board and wrapping paper, according to Winship A. Hodge, manager of the company. The daily output will run 15 to 20 tons. The plant now averages an output of 80 tons a day with its present equipment.

The new machine is to be located on the ground floor of the three story building, located just west of the main mill structure. The beaters and jordons will be placed on the second floor. The present power facilities are ample to handle the additional load.

The installation of this machine was brought about by the Western Board and Paper Company buying all the mill machinery of the Carney Paper Company, at Maumee, Ohio. The cylinder machine was found to be well adapted for use in the Kalamazoo plant. Much of the additional machinery will be disposed of.

Another improvement recently made at the Western Board plant was the installation of a Shartle Brothers cleaning system in the beater room. The cost was approximately $17,000.

Mr. Hodge reports that while it was rather quiet at the holiday time, business is showing very gratifying improvement and the outlook for the year as a whole is excellent.

SWEDISH NEWSPRINT PRODUCTION

Production by Swedish news print mills during the first eleven months of 1926 reached a total of 180,500 metric tons, an increase of approximately 7,000 tons over the corresponding period of 1925.

TECHNICAL ASSOCIATION MEETS

Twelfth Annual Meeting of the Technical Association of the Pulp and Paper Industry is Held at the Waldorf-Astoria, New York

E. C. Tucker, Vice President of the Crocker-McElwain Co. and the Chemical Paper Mfg. Co., Is Chosen President—Reports Show Association Has Had Unusually Satisfactory Year—Total Enrollment Is Now About 800 and Corporate Membership Is Expected Soon To Reach 100—Splendid Spirit of Cooperation Among the Members Makes the Outlook For the Organization Decidedly Encouraging.

The members of the Technical Association of the Pulp and Paper Industry gathered Tuesday morning, February 22, at the Waldorf-Astoria Hotel for their twelfth annual convention. The industry from all the paper making sections of the country as well as Canada was well represented, numerous interesting papers were read and the convention was a big success in every respect. George K. Spence, the retiring president, delivered his annual address as follows:

PRESIDENT'S ADDRESS

According to the custom established at our last annual meeting, in order to save time and duplication of data, my President's Address will also include the report and recommendations of the Executive Committee.

This twelfth annual meeting brings to a close another very successful year for the Technical Association, from both the standpoint of increase in membership and work accomplished.

Membership

We have almost duplicated the good work of last year in reference to increase in corporate membership, ten new ones being added during the past year, which brings the corporate membership list up to fifty-two. If this same persistent effort on the part of the Executive Committee is continued the time is not far distant when our corporate members will number 100 and there seems to be no reason why this number cannot be procured.

There has also been an exceptionally large increase in membership during the past year and at the present time our total enrollment is about 800.

All members should do their share towards securing new members, as the Association is entirely dependent upon dues of the different classes of members for finances with which to carry on its work; and the Association can give service to its members in proportion to the amount of money it has at its disposal to cover expense of service rendered.

E. C. TUCKER, PRESIDENT

Service to Members

The Service to Members Plan has been continually increasing in interest, so much so that there have been as many inquiries under this plan during 1926 as were handled during the combined years of 1924 and 1925. All members should take advantage of this service. If you have any operating trouble in any department of the mill, or desire information on any problem relative to the manufacture of pulp or paper, frame your inquiry and submit it to our secretary who will see that it is sent to the proper members from whom the most helpful information can be procured. Transcripts of replies to more than sixty special inquiries handled under the service to members plan have been sent to members entitled to receive them, who, I suppose you all understand, are members participating and corporate members.

Transcripts of replies to thirty-seven special inquiries have been published in bound form, and can be procured from our secretary at a very nominal cost, considering the value of the information.

Committees

It does not seem necessary to take the time to comment on the work of the different standing committees separately, as they all have been very active during the past year, have done excellent work, and have accomplished results which speak for themselves, and with which all of the members are more or less familiar. The success of our association is dependent upon the interest taken by the various committees in their work, and the fact that the past year has been a very successful one is sufficient evidence of such interest. They all have very interesting programs of papers

and discussions for their sectional meetings, which you will find scheduled for certain specified hours during the week.

Training in the Industry

Before leaving the subject of committee activities it is advisable to make a few remarks and recommendations relative to the work of the committee on Training in the Industry. The personnel of this committee is made up of members with wide experience in their various lines of work. The committee is well balanced in that it is composed of noted educators and proficient operators in, and technical representatives of, pulp and paper mills. They have been doing excellent work, but we very much regret that they have been greatly handicapped, due to a misunderstanding as to the scope of their activities.

After due consideration it is deemed advisable to recommend the appointment of two separate committees, one on Training Technical Men for the Industry, and the other on Vocational Training in the Industry. The first will devote its activities to the study of means of securing greater cooperation between the technical schools and the industry so that students upon graduation will be better fitted for usefulness in the industry, and also to outline plans for technical men to follow in order to fit themselves for efficient pulp and paper mill executives. The Committee on Vocational Training will devote its activities to devising plans for training mill operators, so that they will become more proficient workers, proceeding along somewhat the same lines as are being followed by several mills, where classes are formed for the study of pulp and paper making, using the Technical Association text books as the basis for their work.

Fall Meetings

The fall meeting last year was held at York, Pa., and owing to the excellent arrangements made by P. H. Glatfelter and his local committee, it was considered by all who attended to be the best fall meeting ever held by our association. The local committee certainly set a standard for fall meetings, which will be hard to beat. When considering the amount of work accomplished in addition to the mill visitations and entertainment features, it would have been impossible to have carried out this very successful program if we had not changed the duration of the fall meeting from two to three days. It is imperative that all fall meetings, when held in a pulp or paper manufacturing center, be of three days' duration. If we had continued the custom established several years ago of holding two day meetings, we would eventually have killed our fall meetings.

This past year we arranged to have the proceedings of the fall meeting published for distribution to the members. It is advisable to continue this practice in the future, as there are many interesting and instructive discussions at the fall meetings.

Stream Improvement

Two years ago, in Pennsylvania, was inaugurated the idea of cooperation between the technical representatives of the Sanitary Water Board and pulp and paper manufacturers, by the formation of a committee composed of such representatives, to study ways and means of improving the waters of the state.

This committee later invited the cooperation of similar committees in other states, of the Waste Committee of the Technical Association, and of state and federal agencies qualified to render specific technical service pertinent to such studies.

At the last annual meeting of our association, resolutions were presented by the Waste Committee recommending cooperation between the Waste Committee of the Technical Association and the waste committees of the different States, and also recommending the appointment by the American Paper and Pulp Association of a national committee composed of members of that association, the Technical Association, state waste committees, and state sanitary engineers. The function of the committee would be to further in every way possible, ways and means of solving the problems relative to improvement of the waters of streams in the pulp and paper-making states.

The resolutions were adopted by our association and passed on to the American Paper and Pulp Association for approval and appropriate action. The resolutions received favorable action by the American Paper and Pulp Association and a National Stream Purification Committee of fifteen was appointed by President Norman Wilson.

This committee met in Chicago last June and formulated plans for cooperative action. The National Committee is, therefore, functioning at the present time, and as the Waste Committee of the Technical Association and the state waste committees have been very active during the past year, it is evident that everything is being done that possibly can be done relative to the improvement of the waters in pulp and papermaking states.

Conclusion

As this meeting brings to a close the second year of my service as President of TAPPI, I wish to take this opportunity to express my appreciation of the manner in which the officers and members have cooperated in the work. It is this spirit of cooperation which has been responsible for the splendid growth of our organization, and the exceptional service we have been able to give to our members. The past two years have been very pleasant ones and I have enjoyed the closer association with men in the industry which the office has afforded. If the incoming President is given the same assistance by the officers and members as has been accorded in the past, our association will continue to grow and expand in usefulness.

As President and on behalf of the Executive Committee I wish to thank the chairmen and members of the different standing committees and the entire membership for the assistance they have rendered in making the past year another successful one for TAPPI.

SECRETARY'S REPORT

William G. MacNaughton, secretary of the association, presented the following report:

In surveying the growth of the Technical Association during the five years I have been its secretary, the figures regarding membership have been brought together in the form of a table. In it is shown the membership for each year from 1921 to 1926, inclusive, classified according to the grades—Junior Member, Associate Member, Member and Corporate Member. Following the membership figures for each year the per cent increase compared with the previous year is shown.

In 1926 there were 125 new members elected and against this there were 46 resignations, leaving a net increase of 79 individual members.

During each year a number of Junior Members were transferred to the Associate Member grade and a number of Associate Mem-

CLASSIFICATION OF MEMBERS ACCORDING TO YEARS

Year	1921	1922	Increase	1923	Increase	1924	Increase	1925	Increase	1926	Increase	1927 Forecast	1927 Increase
Member	281			347		356		408		464			
Associate	100			102		126		140		157			
Junior	65			90		71		84		90			
Individual	446	519	73	539	20	553	14	632	79	711	79	796	85
Corporation	31	31	0	32	1	31	−1	42	11	52	10	58	6
Total	477	550	73	571	21	584	13	674	90	763	89	854	91
Increase over previous year		15.3%		3.8%		2.2%		15.5%		13%		12%	

Total increase—285—60%

bers to the grade of Member, of which no record is shown. The important point to note is that there has been an increase each year and that in the five years the total increase has been 286 members or very close to 60 per cent, based on 1921 figures. The net increase of each year since 1921, with the exception of 1923 and 1924, has been more than 14 per cent, the average for the five years being 12 per cent. The increase in numbers for the past two years has been 90 and 89, respectively. The increase in numbers is perhaps the better way to look at it since as membership increases it is more difficult to maintain the same rate. Taking the figure of 91 as a possible one to maintain I have forecast what we should expect this year. This should give a 12 per cent increase, bringing the membership to 854 during the year, with additions of 85 individual and 6 Corporate Members. The assistance of everyone is enlisted to achieve this end.

In further analyzing the membership list according to the industrial connection of the members I have divided them into six classes:

1. Manufacture and direct use of paper and pulp.
2. Manufacture and distribution of machinery and equipment for the paper industry.
3. Manufacture and distribution of chemicals and supplies for the paper industry.
4. Pulp and paper consulting engineers and chemists.
5. Educational institutions serving the paper industry.
6. Miscellaneous.

Under these classifications the following table has been arranged:

	Number of Firms	Number of Members
1. Pulp and paper manufacturing	244	515
2. Machinery and supplies	54	102
3. Chemicals and supplies	44	59
4. Consulting engineers and chemists	46	56
5. Educational institutions serving the paper industry	11	17
6. Miscellaneous		14
	399	763

It shows that of the 763 members 515 are directly connected with pulp and paper, that 244 firms are represented. In the industries allied to the paper industry there are 248 connected with 155 firms.

Service to Members

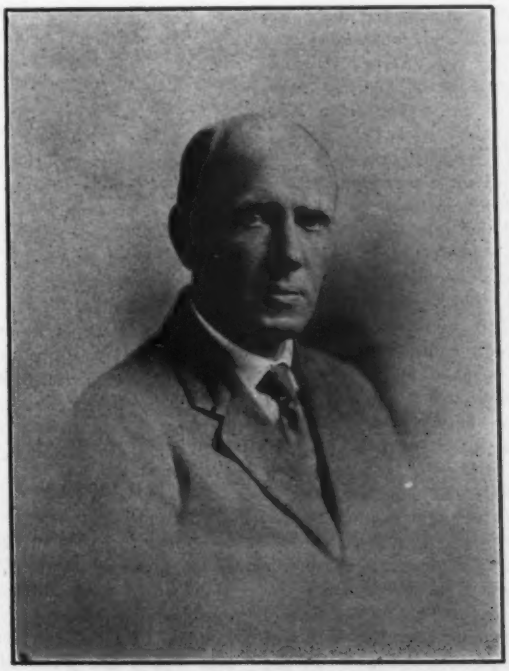
During the year twenty-five special inquiries were handled on which Special Reports were prepared from the discussions received. In order to show the diversity of the problems dealt with the subjects are given:

1. No. 35, Sulphate Smelting Furnaces—Design, construction and life of the lining.
2. No. 36, Rope Stock and Bagging—Method of sampling and moisture testing.
3. No. 37, Screening Bleached Sulphite—Equipment and practice.
4. No. 38, Pitch Difficulties in Sulphite Pulp—Causes and remedies discussed.
5. No. 39, Residual Soda in Kraft Pulp—Effect on kraft container board.
6. No. 40, Asbestos Drier Felts—Records of performance.
7. No. 41, Paper Machine Equipment and Operation for Heavy Paper.
8. No. 42, Slitter Accidents and How to Avoid Them.
9. No. 43, Steam Consumption in Drying Board.
10. No. 44, Specifications for Rope Paper for Sacks.
11. No. 45, Cooking Straw for Strawboard.
12. No. 46, Uses of Sulphite Waste Liquor Discussed.
13. No. 47, Rope Drives for Paper Mills.
14. No. 48, Sulphite for Greaseproof Paper.
15. No. 49, Quality of Salt Cake Discussed.
16. No. 50, Equipment and Power Used in the Mechanical Preparation of Paper Stock.
17. No. 51, Felt Costs on Tissue Machines.
18. No. 52, Requirements of Paper for Soap Wrappers.
19. No. 53, Cleaning Stock for Fine Papers.
20. No. 54, Salt Water and Its Effect in Soda and Sulphate Mills.
21. No. 55, Sulphate Pulp Washing Practice.
22. No. 56, Fuzz on Bleached Sulphite Paper.
23. No. 57, Problem in Manufacturing Patent Coated Board.
24. No. 58, Jordan Fillings and Beater Tackle.
25. No. 59, Soda Pulp Digester Valves.

Towards the end of 1926, as it was found that a considerable number of the earlier special reports were in danger of being forgotten, it was decided to publish those issued prior to 1926. The result was the first volume of *Technical Association Special Reports* which was available to all the members and the industry in general. Since its issue in December the demand has been very gratifying and it is likely that the sales will reimburse the Association for the cost of publication.

Although the assistance to the inquirers on their problems is undoubtedly considerable, not the least of the value is to the members who contributed to the discussions. In getting the data together for presentation, which in general was done carefully, it is usually necessary for one's own conditions to be studied. This in itself is beneficial and in preparing the material there is excellent training towards clarity of thought and expression.

The Sulphite and Sulphate Committees made good use of the Service to Members plan in getting data on the subjects they had under study and which will be further discussed at the sectional meetings.



WILLIAM G. MACNAUGHTON, SECRETARY

Meetings

In addition to the annual meeting in February last year, an extremely successful fall meeting was held at York, Pa., with visits to York Haven, Middletown, and Spring Grove. Too much appreciation cannot be given to the members of the local committee in arranging all the details. Besides the sessions devoted to discussions of practical problems of manufacture of particular interest to the mills in the vicinity, in which the local members took a leading part, very enjoyable visits were made to the leading industrial plants as well as to the historic Battlefield of Gettysburg.

Following the fall meeting the proceedings were published in the second number of *Technical Association Papers*, Series IX.

Later in the fall I had the privilege of attending a meeting of pulp and paper mill engineers at Schenectady, N. Y., arranged by the General Electric Company, where the latest developments in electricity were demonstrated and discussed. It is my conviction that similar meetings by other large manufacturers of machinery and important supplies for the industry would be of immense benefit to paper mill engi-

neers and chemists as well as to themselves, in getting a clear understanding of their mutual problems.

Visits to Members

Early in June I attended the meeting of the Canadian Technical Section in Montreal, held in conjunction with the convention of the Canadian chemists, where cellulose was the chief subject of discussion, and had the pleasure of hearing lectures by Prof. O. Hertzog, of Germany, and other eminent cellulose chemists.

In July and August it was my privilege to accompany R. S. Kellogg on an automobile tour of Wisconsin, Minnesota, Northern Michigan, Northern Ontario and Northern New York. We visited more than sixty paper mills and a number of other plants as well as several new mills in the course of erection, particularly those at Pine Falls, Man.; Port Arthur, Ont.; and Gatineau, Que. In the territory we were able to visit practically all the members and in nearly every plant we found that the work fostered by the Association was being energetically prosecuted. It was altogether a most enjoyable and informative view of the marked progress being made in the paper industry.

Committee Work

During the year the work carried on by the standing committees has advanced very favorably and most of them have something to report. Efforts have been made to develop the activities along lines of direct practical value to the members which can be continued from year to year until completed.

It is especially gratifying to have had a Committee on Sulphate Pulp this year after it had lapsed for several years. This committee is to be congratulated on the energy it has shown and the valuable investigations it has undertaken.

There are a number of important phases of manufacture that are not covered by standing committees. Such are deinking paper, straw pulp, and the entire paper-making operation, including beater treatment and machine operation.

As to paper making, some desire has been evinced for a committee on roofing felt which has its own distinct problems of manufacture and on account of the large tonnage is an important class of paper.

In regard to beating, it would seem that so far a study of the type of equipment used for mechanical treatment and the power required, would properly belong to the Heat, Light and Power Committee. If a committee on beating were formed it would seem best for it to concentrate on the physical and chemical phases of beater control, including hydration, H-ion control, sizing, loading and coloring.

The studies on waste in the industry have been carried on four years and they have shown the extent of the major kinds of material waste and how they can be profitably reduced.

In regard to white water waste and the utilization of barking drum refuse it remains now for the mills to apply the known and proven remedies. So far as the waste committee is concerned it would be advisable to turn its attention to another important subject such as mechanical methods of handling materials.

In regard to the Committee on Training in the Industry its important work is to secure the active cooperation of paper mill executives, the deans of technical schools and the executives of concerns manufacturing equipment and chemicals for the paper industry, that will lead to bridging the gap between the industry and the technical schools. Since many of the charter members of the Association, who were rising chemists or engineers twelve years ago, are now important executives in paper companies, this should not be difficult.

In both fundamental and technical research there are many evidences of progress. Not only have many paper companies developed research organizations that are beginning to show results, but the governments of several paper-making countries here and abroad are enlarging on the activities of their bureaus. In the United States and Canada, where the Technical Association has closest contact, the Forest Products Laboratories and the United States Bureau of Standards are constantly placing the paper industry under an increasing debt of gratitude for their able and extremely helpful assistance.

It has been a gratification to me, personally, that the Technical Association has been of help during the year to a large number of the members, not only in their manufacturing problems but also in a personal way. I, on my part, want to express my gratitude to the President and the Executive Committee as well as the individual and corporate members for their help and cordial cooperation in every way that have been such a material factor in what success has been achieved so far as my office has been concerned.

It is with extreme regret that I have to report the death of two of our members which took place recently, that of A. F. Wilcox and Dr. Wm. Bovard.

FREE TESTING APPARATUS

At a meeting of the Mechanical Pulp Committee held on Thursday morning February 24, it was moved to eliminate the recommendations as to type of instrument contained in the latter part of the paper on Freeness Testing, by Allen Abrams, as follows: "That each manufacturer of free testing apparatus make a master instrument and lay down standard conditions for operating it, conforming if possible, to the Canadian standard temperature and consistency, and that he agree to furnish instruments which are standardized against such a master instrument, and that in turn these manufacturers submit either to the Bureau of Standards or the Forest Products Laboratory their master instruments and method so that they may be callibrated and freeness figures interchanged, it being understood that they bear the expense of calibration."

ELECTION OF OFFICERS

The Technical Association at its annual meeting on Wednesday afternoon elected the following officers:

President—E. C. Tucker, Chemical Paper Manufacturing Co.
Vice-president—P. H. Glatfelter, P. H. Glatfelter Company.
Secretary-Treasurer—W. G. MacNaughton.

Max Krimmel of the Hammermill Paper Company and E. R. Low of the Beaver Products Company were elected members of the executive committee to succeed W. E. B. Baker of the Continental Paper and Bag Mills Corporation, and L. J. Parant of the St. Croix Paper Company whose terms expired this year.

GOVERNMENT PAPER BIDS

The Government Printing Office will receive bids on January 10 for 7,800 pounds (150,000 sheets) of 22x34-52, white bond paper.

The Government Printing Office has received the following bids for 36,000 pounds of various sized No. 2 quality binders board; Virginia Paper Company, Inc., at $66.97 per ton; Mathers-Lamm Paper Company, $66.75; Whitaker Paper Company, $75.00; and Dobler & Mudge, $67.00.

The Aetna Paper Company has been awarded the contract for furnishing the Government Printing Office with 9,037 pounds (112,965 sheets) of white and yellow, 31½x36-80, sulphite bond paper at (white) 7.82 cents; and (yellow) at 8.92 cents per pound. Bids for this paper were received on February 11.

MICHIGAN SUPERINTENDENTS MEET

The right treatment of pulleys, thus securing proper cohesion to pulleys and efficient operation in plants was the gist of a talk given Thursday evening at the February dinner session of the Michigan Division of the American Pulp and Paper Mill Superintendents Association at Kalamazoo, Mich. The speaker, E. Loudon, of the Cling Surface Company, Buffalo, illustrated his talk with a fine series of stereopticon pictures, depicting clearly many of the points covered in the text. The session was held at the Park-American Hotel.

Those Who Attended the Convention

The following is the official registration of the American Paper and Pulp Association:

A

Allen Abrams, Marathon Paper Mills Co., Rothschild, Wis.
G. R. Alden, Dennison Mfg. Co., Framingham, Mass.
J. E. Alexander, Nekoosa-Edwards Paper Co., Port Edwards, Wis.
L. M. Alexander, Nekoosa-Edwards Paper Co., Port Edwards, Wis.
R. L. Allison, U. S. Emblem Co.
A. L. Allen, General Electric Co.
L. C. Anderson, W. B. Oglesby Paper Co., Middletown, Ohio.
W. D. Arnott, Newton Falls Paper Co., Newton Falls, Mass.
W. H. Artz, Westinghouse Electric & Mfg. Co.
F. A. Augsbury, Algonquin Paper Corp., Ogdensburg, N. Y.
Henry Atwater, A. M. Collins Mfg. Co.

B

C. B. Bacon, Wright Co.
H. F. Badgley, Kimberly-Clark Co., Neenah, Wis.
A. C. Bogg, Parsons Paper Co., Holyoke, Mass.
Edward P. Bogg, Boston Paper Co.
J. L. Bogg, Millers Falls Paper Co., Millers Falls, Mass.
P. K. Baird, Forest Products Laboratory, Madison, Wis.
H. T. Baker, H. S. Taylor, Montreal, Que.
C. M. Baker, State Sanitary Engineer of Wis.
Dr. Hugh P. Baker, Sec., American Paper & Pulp Association, New York.
W. E. Byron Baker, Continental Paper & Bag Mills Corp., New York.
John Ball, Beaver Wood Fibre Co.
H. R. Baldwin, Hammermill Paper Co., Erie, Pa.
F. J. Baldwin, Munising Paper Co., Munising, Mich.
H. C. Barbour, International Pulpstone Co.
Norman Bardeen, Lee Paper Co.
G. E. Bardwell, Carew Mfg. Co., South Hadley Falls, Mass.
L. F. Barsalous, Union Bag & Paper Corp.
F. L. Barstow, U. S. Rubber Co.
L. A. Bassett, McLaurin-Jones Co., Brookfield, Mass.
Philip C. Batzle, Martin Cantine Co., Saugerties, N. Y.
S. C. Bayless, Bayless Pulp & Paper Co.
Robert S. Bayntun, Rust Engineering Co.
Geo. D. Bearce, News Print Service Bureau, New York.
R. Q. Bease, Nashua River Paper Co.
Hunter Beaty, Yellow Pine Paper Mill Co., Orange, Tex.
Edward Beck, Canadian Pulp & Paper Association.
F. K. Becker, Bird Machine Co., South Walpole, Mass.
Folke Becker, Rhinelander Paper Co., Rhinelander, Wis.
Clarence Beebe, Neumeyer & Dimond, New York.
Howard Beedy, Oxford Paper Co., New York.
C. E. Behre, Northeastern Forest Experiment Station.
Dr. T. C. Bentzen, Whiting-Plover Paper Co., Stevens Point, Wis.
O. L. Berger, G. D. Jenssen Co., New York.
E. A. Bergholtz, American Telephone & Telegraph Co., New York.
M. Berlau, Berlau Paper House, Kansas City, Mo.
R. D. Bertschy, Miamisburg Paper Co.
M. R. Bhagwat.
H. L. Bing, Paper & Textile Machinery Co.
W. E. Black, Hoberg Paper & Fiber Co., Green Bay, Wis.
Gordon Blanchard, Crocker-McElwain Co., Holyoke, Mass.
Dr. G. W. Blanco, Dupont, Rayon & Co., Buffalo, N. Y.
L. M. Booth, Booth Chemical Co.
H. R. Boston, Stevens & Thompson Paper Co., North Hoosick, N. Y.
Ralph L. Bosworth, Crocker-McElwain Co., Holyoke, Mass.
Chas. W. Boyce, U. S. Forest Service.
G. W. Boyce, Boyce Paper Exchange.
F. E. Bragg, Orono Pulp & Paper Co., Orono, Maine.
Forrest W. Brainerd, Dill & Collins Co., Philadelphia, Pa.
H. E. Brakewood, Ohio Box Board Co.
M. C. Bramham, Fort Howard Paper Co., Green Bay, Wis.
Paul Bray, University of Maine, Orono, Me.
William Braun, Constantator Co., Inc.
W. DuB. Brookings, Chamber of Commerce of the U. S.
Arthur M. Brooks, Raffold Co. of America.
D. K. Brown, Neenah Paper Co., Neenah, Wis.
G. Arthur Brown, Bennett Co., Ltd., Chambly Canton, Que.
H. H. Brown, St. Albans, Vt.
H. L. Brown, Brown Paper Mill Co., Monroe, La.
R. C. Brown, Kimberly-Clark Co., Neenah, Wis.
Wm. T. Brust, Hammermill Paper Co., Erie, Pa.
G. O. Bryant, Alberene Stone Co., New York.
R. A. Buhrer, Union Waxed & Tissue Paper Co.
J. G. Bullard, Warren Mfg. Co.
H. V. Burgee, Neenah Paper Co., Neenah, Wis.
Kencrick Burns, S. D. Warren Co.
L. B. Burt, National Lime Association, Washington.
E. H. Burton, A. P. W. Paper Co., Albany, N. Y.
Stanley Byron, Hammermill Paper Co., Erie, Pa.

C

D. E. Cable, Oxford Paper Co., Brooklyn, N. Y.
Geo. J. Cadwell, American Writing Paper Co., Holyoke, Mass.
E. P. Cameron, Forest Products Laboratory, Madison, Wis.
Jas. A. Cameron, Cameron Machine Co., Brooklyn, N. Y.
James E. Campbell, Dexter Sulphite Pulp & Paper Co., Dexter, N. Y.
H. R. Cantine, Martin Cantine Co., New York.
T. J. Carlin, Advance Bag & Paper Co.
P. W. Carr, National Aniline & Chemical Co., New York.
F. T. Carson, Bureau of Standards, Washington, D. C.
R. M. Carson, Fort Howard Paper Co., Green Bay, Wis.
Emmett B. Carter, Consulting Engineer.
Geo. H. Carter, Government Printing Office, Washington, D. C.
W. L. Carter, Nashua Gummed & Coated Paper Co., Nashua, N. H.
V. B. Case, Paper Makers Importing Co.
Howard A. Casey, Hampshire Paper Co., South Hadley Falls, Mass.
E. S. Catlin, Pejepscot Paper Co., Brunswick, Me.
C. W. Chabot, Hammermill Paper Co., Erie, Pa.
E. C. Chadwick, L. L. Brown Paper Co., Adams, Mass.
P. S. Chadwick, Chapin & Gould Paper Co., New York.
O. T. Chalon, General Dyestuff Corp., New York.
R. F. Chapin, Millers Falls Paper Co., Millers Falls, Mass.
M. P. Chaplin, White Plains, N. Y.
H. L. Charles, E. Z. Opener Bag Co., Braithwaite, La.
R. C. Charron, U. S. Envelope Co.
H. A. Chase, Brown Co.
L. L. Claflin, Erving Paper Mills, Erving, Mass.
A. B. Clark, J. O. Ross Engineering Corp., New York.
C. B. Clark, Riverside Fibre & Paper Co., Appleton, Wis.
Gilbert L. Clark, Smith Paper Co., Lee, Mass.
Dr. G. L. Clark.
M. Cline, International Paper Co.
I. W. Coates, American Can Co.
B. W. Codwise, Beaver Products Co., Buffalo, N. Y.
Dexter D. Coffin, C. H. Dexter & Sons, Windsor Locks, Conn.
Dr. George Coggeshall, Industrial Research Laboratories.
M. T. Cole, Watab Paper Co., Sartell, Minn.
G. N. Collins, Dill & Collins Co., Philadelphia, Pa.
H. B. Collins, Dill & Collins Co., Philadelphia, Pa.
H. H. Collins, Jr., A. M. Collins Mfg. Co.
Lewis T. Condon, Continental Paper & Bag Mills Corp.
J. M. Conway, Hoberg Paper & Fiber Co., Green Bay, Wis.
O. L. Cook, Lehigh Lime Co.
T. A. Cook, West Virginia Pulp & Paper Co.
C. H. Cooley, Taylor-Logan Papermakers Co., Holyoke, Mass.
S. B. Copeland, Eastern Mfg. Co., Bangor, Me.
Wm. R. Copeland, Connecticut State Water Commission.
John Cornell, The Paper Mill, New York.
A. F. Cosby, American Writing Paper Co.
T. B. Cowie, Orono Pulp & Paper Co., Orono, Me.
E. B. Cowles, American Engineering Co., Philadelphia, Pa.
E. M. Cowling, Hawthorne Paper Co., Kalamazoo, Mich.
James H. Coy, Flambeau Paper Co., Park Falls, Wis.
Geo. E. Crafts, Orono Pulp & Paper Co., Orono, Me.
H. J. Craig, S. D. Warren Co.
W. M. Crane, Crane & Co., Dalton, Mass.
C. A. Crocker, Crocker-McElwain Co., Holyoke, Mass.
D. A. Crocker, Salesmen's Association, New York.
W. W. Cronkhite, General Electric Co., Schenectady, N. Y.
T. L. Cressley, Industrial Laboratories.
L. W. Crouse, Bennett, Ltd., Chambly Canton, Que.
Leo E. Croy, Menasha Printing & Carton Co., Menasha, Wis.
F. E. Cuddeback, General Electric Co.
Fred A. Cummings, U. S. Envelope Co., Springfield, Mass.
F. A. Curtis, American Writing Paper Co., Holyoke, Mass.
F. J. Curtis, Merrimac Chemical Co.
H. H. Curtis, Consolidated Water Power & Paper Co., Appleton, Wis.

D

S. T. Dana, U. S. Forest Service.
Walter C. Daley, Port Huron Sulphite & Paper Co., Port Huron, Mich.
Major F. E. Daniels, Pennsylvania Dept. of Health.
Samuel Dauman, M. Gottesman & Co., New York.
C. S. Davis, Waterfalls Paper Mills.
M. M. Davis, Hammermill Paper Co., Erie, Pa.
J. F. Davis, Frank H. Davis Co., Cambridge, Mass.
W. L. Davis, Jr., Dells Pulp & Paper Co., Eau Claire, Wis.
J. A. DeCew, Process Engineers, Inc., New York.
C. D. DeMers, Union Bag & Paper Corp.
V. S. Denison, Paper & Textile Machinery Co.
Wm. F. Dewey, B. D. Rising Paper Co., Housatonic, Mass.
Philip Dewolf, Joubert & Goslin Machine & Foundry Co., New York.
H. A. Dickie, Label Manufacturers Association.
J. C. Diffenderfer, Paper Makers Chemical Co., Holyoke, Mass.
M. L. Dinkelspiel, National Paper Products Co.
T. H. Donlan, Detroit Sulphite Pulp & Paper Co., Detroit, Mich.
R. B. Donnelley, Central Waxed Paper Co.
Marius Doye, Port Alfred Pulp & Paper Co., Port Alfred, Que.
Pierre Drewsen, Barrett & Co., Elizabeth, N. J.
J. F. Dunifer, Oxford Miami Paper Co.
G. C. Dunn, Dunn Sulphite Paper Co., Port Huron, Mich.

E

T. D. Earle, Michigan Paper Co.
F. G. Eastland, Underwood Paper Mills, Plattsburg, N. Y.
E. P. Eddy, National Paper Products Co., San Francisco, Cal.
G. A. Eastwood, Parsons Paper Co., Holyoke, Mass.
F. J. Edmonds, Wausau Paper Mills Co., Brokaw, Wis.
Wm. J. Eisner, Newark Paraffine & Parchment Co.
H. D. Eliason, Central Paper Co., Muskegon, Mich.
Ivar Ekholm, National Aniline & Chemical Co., New York.
H. W. Ellerson, Albemarle Paper Mfg. Co., Richmond, Va.
R. L. Eminger, American Pulp & Paper Mill Superintendents Association.
G. F. Enderlein, Wausau Sulphate Fibre Co., Mosinee, Wis.
Rantoul Endicott, International Paper Co.
T. H. Epes, Epes-Fitzgerald Paper Co.
E. H. Ertel, Dill & Collins Co., Philadelphia, Pa.
C. M. Eshelman, Cameron Machine Co., Brooklyn, N. Y.
Irving N. Esleeck, Esleeck Mfg. Co.
R. E. Estes, Standard Paper Mfg. Co., New York.
D. W. Evans, Union Bag & Paper Corp.
Walter F. Evans, Nashua Gummed & Coated Paper Co., Nashua, N. H.
D. C. Everest, Marathon Paper Mills Co., Rothschild, Wis.
J. M. S. Ewing, Cherry River Paper Co.
R. D. W. Ewing, American Writing Paper Co., New York.

F

Arthur F. Fay, Parker-Young Co.
Robert C. Fay, American Writing Paper Co., Holyoke, Mass.
Nelson Feeley, Strathmore Paper Co., Mittineague, Mass.
R. R. Fenska, N. Y. State College of Forestry, Syracuse, N. Y.
W. M. Fischer, Curtis & Bro. Co., Newark, Del.
H. H. Fish, Jr., Great Western Paper Co., Ladysmith, Wis.
Paul S. Fiske, Parker-Young Co.
E. J. Fitzgerald, Scott Paper Co., Chester, Pa.
J. W. Fitzgerald, Canadian Export Paper Co.
M. C. Fleming, Hardinge Co.
Harry Fletcher, Fletcher Paper Co.
S. W. Fletcher, J. O. Ross Engineering Corp., New York.

Those Who Attended the Convention

W. B. Ford, American Glue Co.
W. L. Forsyth, Victoria Paper Mills Co., Fulton, N. Y.
A. M. Fowler, General Electric Co., Schenectady, N. Y.
Ralph N. Fowler, Hampden Glazed Paper & Card Co., Springfield, Mass.
T. C. Fowler, G. H. Mead Co.
W. S. Fowler, Hampden Glazed Paper & Card Co.
Fred Fox, Creston Paper Co.
James Foxgrover, Western Paper Makers.
A. E. Frampton, Hammermill Paper Co., Erie, Pa.
B. A. Franklin, Strathmore Paper Co., Mittineague, Mass.
Nils Frenne, Ruths Accumulator Co.
E. B. Fritz, Paper Industry, Chicago.
J. A. Frost, National Paper Products Co.
E. H. Frothingham, Appalachian Forest Experiment Station.
Wm. B. Fulton, Fulton Engineering Works, Middletown, Ohio.

G

G. A. Gardner, M. Gottesman & Co., New York.
C. C. Garland, Tacoma, Wash.
I. Garland, Fletcher Paper Co., New York.
T. R. Gautier, Nashua Gummed & Coated Paper Co., Nashua, N. H.
O. P. Gephart, Oxford Miami Paper Co.
G. H. Gerpheide, Hawthorne Paper Co., Kalamazoo, Mich.
Geo. B. Gibson, Wausau Sulphate Fibre Co.
Geo. K. Gibson, Wausau Sulphate Fibre Co.
G. L. Giddings, Byron Weston Co., Dalton, Mass.
G. N. Gilbert, Gilbert Paper Co., Menasha, Wis.
T. M. Gilbert, Gilbert Paper Co., Menasha, Wis.
A. G. Gilman, Allied Paper Mills, Kalamazoo, Mich.
E. P. Gleason, Nekoosa-Edwards Paper Co., Port Edwards, Wis.
Otto J. Goeppinger, Armstrong Machine Works, New York.
A. B. Goodrich, Riverside Paper Mfg. Co., Appleton, Wis.
C. I. Gordon, Bayless Paper Corp., New York.
M. H. Grassly, Strathmore Paper Co., Mittineague, Mass.
C. S. Gravatt, Western Union Telegraph Co., New York.
A. B. Green, Nashua Gummed & Coated Paper Co., Nashua, N. H.
H. B. Greene, Niagara Paper Mills, Lockport, N. Y.
W. E. Greene, W. E. Greene Corp.
W. W. Greenward, Norton & Co.
A. D. Griffin, C. H. Dexter & Sons.
H. H. Griswold, C. H. Dexter & Sons, Windsor Locks, Conn.
A. S. Guggenheimer, United Mfg. Co.

H

F. C. Hahn, Dupont Co.
Gosta Hall, Albemarle Paper Mfg. Co., Richmond, Va.
H. E. Hallman, Continental Paper & Bag Mills Corp., New York.
E. G. Ham, John A. Manning Co., Troy, N. Y.
G. K. Hamill, Glue Research Corp.
R. F. Hammond, R. F. Hamilton, Inc., New York.
Don Hanly, International Paper Co., New York.
E. H. Hanson, Northern Paper Mills, Green Bay, Wis.
H. H. Hanson, Eastern Mfg. Co., Bangor, Me.
Walter G. Hanson, Fort Howard Paper Co., Green Bay, Wis.
E. M. Harford, H. J. Cole Co.
R. O. Harper, B. D. Rising Paper Co., Housatonic, Mass.
T. W. Harrington, Crocker-McElwain Co., Holyoke, Mass.
H. H. Harrison, Crystal Tissue Co., Middletown, Ohio.
Morris Harrison, Hammermill Paper Co., Erie, Pa.
John M. Hart, Chicago.
M. T. Hartley, Paul A. Sorg Paper Co., Middletown, Ohio.
J. M. Hartman, Continental Paper & Bag Mills Corp.
G. D. Haskell, Dilts Machine Works, Fulton, N. Y.
N. O. Haynes, U. S. Envelope Co., Springfield, Mass.
L. F. Hayward, Fox River Paper Co., Appleton, Wis.
R. A. Hayward, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.
James H. Hazelwood, Barber Asphalt Co.
W. L. Heath, W. L. Heath Co.
Hermann Heimann, New York.
H. A. Helder, Champion Fibre Co., Canton, N. C.
A. B. Helffrich, Orono Pulp & Paper Co., Orono, Me.
C. J. Hendricks, Consolidated Water Power & Paper Co., Appleton, Wis.
C. Henningsen, Dupont, Rayon Co., Buffalo, N. Y.
Ralph B. Hersey, Cost Acct., Hollingsworth & Vose Co., Boston, Mass.
Prof. E. Heuser, Riordon Pulp Corp.
C. L. Higgins, Finch, Pruyn & Co., Glens Falls, N. Y.
R. P. Hill, Pulp Bleaching Corp.
A. K. Hinds, Carthage Machine Co., Carthage, N. Y.
J. R. Hinksen, Hampden Glazed Paper Co.
W. O. Hisey, Oxford Paper Co., New York.
R. L. Hoenstine, York Haven Paper Co., York Haven, Pa.
Spencer M. Holden, Crocker-McElwain Co., Holyoke, Mass.
Geo. S. Holmes, Brown Paper Mills Co., Monroe, La.
J. E. Holmes, Crocker-McElwain Co., Holyoke, Mass.
J. J. Hood, A. M. Collins Mfg. Co.
A. H. Hooker, Jr., Hooker Chemical Co.
S. P. Hoopes, Finch, Pruyn & Co., Glens Falls, N. Y.
B. Hopper, Hopper Paper Co., Taylorville, Ill.
E. H. Horstkotte, General Electric Co.
Ralph S. Hosmer, Prof. of Forestry, Cornell University.
Geo. W. Houk, Wrenn Paper Co., Middletown, Ohio.
R. T. Houk, Jr., G. H. Mead Co.
Wm. H. Howe, Mulford Paper Mills.
C. M. Howell, Scott Paper Co., Chester, Pa.
K. B. Howell, Consulting Engineer.
W. H. Howell, New York & Pennsylvania Co.
C. A. Hubbard, Kalamazoo, Mich.
Frederic W. Hume, New York.
Fred Hummel, Hummel Ross Fibre Corp., Hopewell, Va.
J. P. Hummel, Hummel-Ross Fibre Corp., Hopewell, Va.
S. A. Hummer, York Haven Paper Co., York Haven, Pa.
C. W. Hurtebis, Hammermill Paper Co., Erie, Pa.
Harry E. Hyde, Ideal Cup Corp.

I

T. H. Ireland, Crane Co., New York.
Chester C. Irving, Falulah Paper Co., Fitchburg, Mass.
I. Iverson, Mid-States Wrapping Paper Co.

J

Luther C. Jeffress, Wortendyke Mfg. Co., Richmond, Va.
Harry Jennings, Tanglefoot Co.
J. D. Jenssen, G. D. Jenssen Co., New York.
C. A. Jobson, New York & Pennsylvania Co.
R. Johnsen, Hammermill Paper Co., Erie, Pa.
E. V. Johnson, U. S. Envelope Co., Springfield, Mass.
J. M. Johnson, Marinette & Menominee Paper Co., New York.
W. O. Johnson, Strathmore Paper Co.
Warren S. Johnson, Curtis & Bro. Co., Newark, Del.
E. J. Johnstone, Paper Makers Chemical Co., Holyoke, Mass.
Howard Jones, Harding-Jones Paper Co., Excello, Ohio.
Tom Jones, Harding-Jones Paper Co., Excello, Ohio.
W. A. Jones, Riverside Fibre & Paper Co., Appleton, Wis.
William Jones, Riverside Fibre & Paper Co., Appleton, Wis.
A. L. Joseph, Republic Paper Products Corp.

K

John H. Karges, C. H. Dexter & Sons, Windsor Locks, Conn.
Robert H. Kean, National Lime Association, Washington.
Horace Keesey, Jr., Schmidt & Ault Paper Co., York, Pa.
H. T. Kehew, Berwin Paper Corp., Danville, N. Y.
P. D. Kelleter, College of Forestry.
R. S. Kellogg, Sec., News Print Service Bureau, New York.
L. E. Kelly, American Writing Paper Co.
A. V. Kennedy, Sandy Hill Iron & Brass Works, Hudson Falls, N. Y.
G. F. Kennedy, Hercules Powder Co., Wilmington, Del.
John P. Kennedy, American Writing Paper Co.
C. H. Kent, Kalbfleisch Corp.
O. E. Kiaer, Buck, Kiaer & Co., Inc., New York.
Francis Kiefer, Canada Forwarding Co.
Helen U. Kiely, American Writing Paper Co., Holyoke, Mass.
D. B. Kimball, Bird & Son, Inc., East Walpole, Mass.
H. C. Kinne, Bagley & Sewall, Watertown, N. Y.
C. E. Kinney, Hercules Powder Co., Wilmington, Del.
W. Kishbaugh, Abitibi Power & Paper Co.
Arthur Klein, Hammermill Paper Co., Erie, Pa.
John H. Kline, York Haven Paper Co., York Haven, Pa.
F. P. Klund, Hammermill Paper Co., Erie, Pa.
Harold W. Knight, Bulkley, Dunton & Co.
S. C. Knode, Albemarle Paper Mfg. Co., Richmond, Va.
Paul Koenig, Continental Paper & Bag Mills Corp., New York.
M. A. Krimmel, Hammermill Paper Co., Erie, Pa.
Theo Krueger, Better Packages, Inc., New York.
H. L. Kutter, Black-Clawson Co., Hamilton, Ohio.

L

R. H. Laftman, Bogalusa Paper Co., Bogalusa, La.
D. Lake, Paper & Textile Machinery Co., Sandusky, Ohio.
Harry R. Landers, Hammermill Paper Co., Erie, Pa.
W. W. Langtry, District of Columbia Paper Mfg. Co., Washington, D. C.
Ben Lapides, Continental Paper & Bag Mills Corp.
D. E. Landerburn, Consulting Forest Engineer.
Howard Laymon, Mead Pulp & Paper Co., Chillicothe, Ohio.
S. M. Lee, Calcasieu Sulphate Paper Co., Inc., Elizabeth, La.
Hulett Lee, Chemical Paper Mfg. Co., Holyoke, Mass.
R. W. Leeper, Canadian General Electric Co.
G. H. Lentz, U. S. Forest Service.
F. S. Leonard, Fisk Paper Co., Hinsdale, N. H.
George Lewis, American Instrument Co.
C. E. Libby, N. Y. State College of Forestry, Syracuse, N. Y.
Harry Liebeck, Scott Paper Co., Chester, Pa.
H. E. Lindquist, Missisquoi Pulp & Paper Co., Sheldon Springs, Vt.
J. H. Lingerfelder, Brownville Paper Co., Brownville, N. Y.
Herbert Lippitt, International Paper Co.
R. R. Lipstren, Continental Paper & Bag Mills Corp.
J. S. Little, Western Electric Co.
H. H. Lockey, B. D. Rising Paper Co., Housatonic, Mass.
Wm. C. Lodge, Oswego Falls Corp.
G. E. Lofgren, Combustion Engineering Corp., Ltd.
L. J. Long, Crystal Tissue Co., Middletown, Ohio.
A. C. Long, Jr., Bogalusa Paper Co., Inc., Bogalusa, La.
L. E. Longstreth, Gardner & Harvey Co., Middletown, Ohio.
A. C. Looke, Valley Paper Co., Holyoke, Mass.
E. R. Lowe, Paper Products Co.
E. F. Lowe, Falulah Paper Co.
M. B. Lowe, Lowe Paper Co.
W. S. Lucey, Hammermill Paper Co., Erie, Pa.
H. A. Lundberg, G. D. Jenssen Co., New York.
A. George Lutz, New York.
E. R. Lyman, Missisquoi Pulp & Paper Co., Sheldon Springs, Vt.

M

A. A. MacDiarmd, Price Bros. & Co., Ltd., Kenogami, Que.
R. G. MacDonald, Chemical and Metallurgical Engineering, New York.
R. B. MacDougall, American Writing Paper Co.
W. G. MacNaughton, Sec., TAPPI, New York.
B. T. McBain, Portland, Ore.
Rankin C. McCaskey, Coated Paper Products Co.
W. S. McClellan, P. H. Glatfelter Co., Spring Grove, Pa.
M. F. McCombs, Electro Bleaching Gas Co.
James C. McCormick, Knowlton Bros., Inc., Watertown, N. Y.
Wm. J. McCormick, American Writing Paper Co.
Chas. McDowell, McDowell Paper Mills, Manayunk, Pa.
J. N. McDowell, Fox River Paper Co., Appleton, Wis.
R. F. McElwain, Crocker-McElwain Co., Holyoke, Mass.
John McEwan, American Tissue Mills, South Hadley, Mass.
J. W. McGee, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Wm. A. McGilpin, Strathmore Paper Co., Mittineague, Mass.
Miss L. E. McGrath, Booth Chemical Co.
Irving McHenry, Mid-States Gummed Paper Co.
W. E. McIntyre, McIntyre Bros. Paper Co.
Dr. R. H. McKee, Columbia University.
Wm. W. McLaurin, McLaurin-Jones Co., Brookfield, Mass.

Those Who Attended the Convention

John McLaurin, McLaurin-Jones Co., Brookfield, Mass.
Hector McVicker, Chillicothe Paper Co., Chillicothe, Ohio.
G. A. Macklem, Beloit Iron Works, Beloit, Wis.
W. S. Macklem, Black-Clawson Co., Hamilton, Ohio.
Russell S. Madden, American Writing Paper Co., Holyoke, Mass.
Carl Magnus, Standard Paper Mfg. Co., Richmond, Va.
F. W. Main, Worthy Paper Co., Mittineague, Mass.
I. J. Marcuse, Bedford Pulp & Paper Co., Richmond, Va.
W. B. Marston, Keith Paper Co.
H. W. Martin, Martin Pulp & Paper Co., Norwood, N. Y.
J. Gilbert Mason, Miner-Edgar Co., New York.
W. H. Mason, Mason Fibre Corp., Laurel, Miss.
R. C. Mateer, Scott Paper Co., Chester, Pa.
W. R. Maull, Dill & Collins Co.
W. D. Maxim, International Paper Co., New York.
A. Y. Meeker, Standard Soapstone Corp., New York.
A. R. Melker, Ajax Paper Mills.
G. F. Merriam, Holyoke Card & Paper Co., Springfield, Mass.
C. H. Merrill, McLaurin-Jones Co., Brookfield, Mass.
W. H. Meyer, Brown Paper Mill Co., Monroe, La.
A. F. Meyers, Meyer Governor Co.
K. M. Miars, Continental Paper & Bag Mills Corp.
Roger Miliar, Ruths Accumulator Co., New York.
J. D. Miller, York Haven Paper Co., York Haven, Pa.
K. F. Miller, Keith Paper Co.
O. A. Miller, B. D. Rising Paper Co., Housatonic, Mass.
R. N. Miller, Technical Association.
O. J. Mills, Sandy Hill Iron & Brass Works, Hudson Falls, N. Y.
W. H. Millspaugh, Paper & Textile Machinery Co., Sandusky, Ohio.
Miss Jessie Minor, Collins Mfg. Co.
J. E. Mitchell, Utica Paper Co.
W. G. Mitchell, Price Bros. & Co., Ltd., Kenogami, Que.
A. J. F. Montabone.
J. S. Montgomery, McLaurin-Jones Co., Brookfield, Mass.
Don Montville, Shartle Bros. Machine Co., Middletown, Ohio.
W. F. Moody, G. W. Moody & Son.
W. D. Mooney, International Paper Co.
A. W. Moore, Shawmut Waxed Paper Co.
Geo. W. More, Geo. W. Millar & Co., New York.
H. W. Morgan, N. Y. State College of Forestry, Syracuse, N. Y.
C. H. Morian, Cherry River Paper Co.
H. A. Morrison, Oliver Continuous Filter Co., New York.
G. Stanley Morse, Valley Paper Co., Holyoke, Mass.
M. E. Moyer, West Carrollton Parchment Co., West Carrollton, Ohio.
C. E. Mueller, Western Paper Makers Chemical Co.
W. A. Munro, Munising Paper Co., Munising, Mich.
P. G. Murar, Riordan Paper Co.

N

Fred Naegeli, R. T. Vanderbilt Co., New York.
Alfred S. Nalle, Hummel-Ross Fibre Corp., Hopewell, Va.
Jas. B. Nash, Nekoosa-Edwards Paper Co.
Wm. E. Neumeyer, Neumeyer & Dimond, New York.
H. B. Newton, Newton Paper Co., Holyoke, Mass.
C. W. Nickenig, Canadian Export Paper Co.
A. W. Nickerson, Process Engineers, Inc., New York.
W. A. Niviling, Huron Milling Co.
W. L. Nixon, American Writing Paper Co.
J. H. Noble, Oliver Continuous Filter Co., New York.
Otto Nordstrom, Otto Nordstrom Co.
H. P. G. Norstrand, Saranac Pulp & Paper Co., Plattsburg, N. Y.
R. A. North, Green Bay Foundry & Machine Works, Green Bay, Wis.
C. Y. Norton, Strathmore Paper Co., Mittineague, Mass.
W. L. Nye, Scott Paper Co., Chester, Pa.

O

A. A. Oatman, Cliff Paper Co., Niagara Falls, N. Y.
H. F. Obermanns, Hammermill Paper Co., Erie, Pa.
E. A. Oberweiser, Whiting-Plover Paper Co., Stevens Point, Wis.
I. J. O'Brien, Paper Mill.
M. B. Olmstead, Fox River Paper Co., Appleton, Wis.
E. Olsson, Chesapeake Corp., West Point, Va.
Geo. N. Ostrander, Finch, Pruyn & Co., Inc., Glens Falls, N. Y.

P

Felix Pagenstecher, Bryant Paper Co.
R. H. Palmer, Albemarle Paper Mfg. Co., Richmond, Va.
L. J. Parant, St. Croix Paper Co.
H. O. Parker, Mathieson Alkali Works, Inc., New York.
John L. Parsons, Hammermill Paper Co., Erie, Pa.
F. W. Partch, J. O. Ross Engineering Works, New York.
C. Patch, Orono Pulp & Paper Co., Orono, Me.
R. L. Pease, Knowlton Bros., Watertown, N. Y.
Walter E. Perry, Chemical Paper Mfg. Co., Holyoke, Mass.
J. S. Peters, American Writing Paper Co., Holyoke, Mass.
F. C. Peterson, N. Y. State College of Forestry.
B. M. Petrie, Eastern Mfg. Co., Bangor, Me.
Dennett Phillips, Bird Machine Co., South Walpole, Mass.
C. H. Phipps, Watab Paper Co., Sartell, Minn.
T. E. Pierce, U. S. Envelope Co., Springfield, Mass.
W. E. Piper, Dorr Machinery Co., New York.
W. A. Pitts, York Haven Paper Co., York Haven, Pa.
A. F. Platt, Hollingsworth & Vose Co., Boston, Mass.
Brenton C. Pomeroy, Byron Weston Co., Dalton, Mass.
O. M. Porter, Asst. Sec., American Paper & Pulp Association.
John W. Powell, Allied Paper Mills, Kalamazoo, Mich.
E. S. Pratt, Pratt Paper Co.

Q

H. D. Quickel, Schmidt & Ault Paper Co., York, Pa.
D. L. Quirk, Jr., Peninsula Paper Co., Ypsilanti, Mich.

R

Harold R. Rafton, Raffold Co. of America.
B. J. Raeber, Paperboard Industries Association.
James B. Ramage, Franklin Paper Co., Holyoke, Mass.
Lawson Ramage, Missisquoi Pulp & Paper Co., Sheldon Springs, Vt.
Z. W. Ranck, Crystal Tissue Co., Middletown, Ohio.
W. H. Randall, Rexpulp Co., New York.
Walter D. Randall, Champion Coated Paper Co.
H. F. Ray, Scott Paper Co., Chester, Pa.
Walter J. Raybold, B. D. Rising Paper Co., Housatonic, Mass.
G. F. Reale, Hooker Electrical Chemical Co., New York.
E. O. Reed, Government Printing Office, Washington, D. C.
Geo. W. Reed, Continental Paper & Bag Mills Corp.
R. I. Reider, Victoria Paper Mills, Fulton, N. Y.
T. R. Remsen, Union Bag & Paper Corp.
I. S. Reynolds, Nekoosa-Edwards Paper Co., Port Edwards, Wis.
H. H. Reynolds, B. D. Rising Paper Co., Housatonic, Mass.
L. C. Reynolds, American Writing Paper Co.
John F. Rhoades, Mead Pulp & Paper Co., Chillicothe Ohio.
Grant Richardson, Hammermill Paper Co., Erie, Pa.
A. F. Richter, Stebbins Engineering & Mfg. Co., Watertown, N. Y.
C. F. Richter, Vera Chemical Corp.
I. B. Rieg, Erving Paper Mills, Erving, Mass.
J. D. Robb, Dominion Engineering Works, Ltd.
E. B. Roberts, Bemis Bro. Bag Co., Peoria, Ill.
I. R. Roberts, E. I. DuPont DeNemours & Co., Inc.
O. C. Robertson.
C. P. Robinson, Borregaard Co., New York.
James T. Robinson, American Writing Paper Co.
Frank J. Roche, Crocker-McElwain Co.
W. O. Roe, Individual Drinking Cup Co.
H. W. Rogers, General Electric Co.
Fred J. Rooney, Upson Co., Lockport, N. Y.
C. T. Roos, National Envelope Co., Div. U. S. Envelope Co.
John D. Rue, Forest Products Laboratory, Madison, Wis.
F. C. Ruhling, Ideal Cup Corp., Brooklyn, N. Y.
A. N. Russell, Dominion Engineering Works.
J. R. Russell, Marathon Paper Mills Co., Rothschild, Wis.
James F. Ryland, Standard Paper Mfg. Co., Richmond, Va.

S

C. F. Sammet, Crane & Co., Dalton, Mass.
Frank Sanborn, McLaurin-Jones Co., Brookfield, Mass.
F. Henry Savage, International Paper Co.
Thomas H. Savery, Nash Engineering Co.
William H. Savery, Harpers Ferry Paper Co., Harpers Ferry, W. Va.
Wm. E. Sayle, National Envelope Co.
R. J. Schadt, Port Alfred Pulp & Paper Co., Port Alfred, Que.
A. F. Schenkelberger, Safepack Mills.
J. Carl Schmidt, E. I. DuPont DeNemours & Co., Inc.
H. Z. Schniewind, Foreign Paper Mills, New York.
P. P. Schnorbach, Filer Fibre Co., Filer City, Mich.
John Schock, Newton Falls Paper Co.
D. S. Scott, Carolina Fibre Co., Hartsville, S. C.
B. W. Scribner, Bureau of Standards, Washington, D. C.
R. T. Scully, General Electric Co.
F. H. Sellars, Jr., U. S. Envelope Co.
Merle B. Shaw, Bureau of Standards, Washington, D. C.
Edward Sheahan, Manistique Pulp & Paper Co., Manistique, Mich.
John B. Shepherd, Peninsula Paper Co., Ypsilanti, Mich.
W. M. Shoemaker, Jr., National Vulcanized Fibre Co.
Arthur J. Sigel, M. Gottesman & Co.
R. H. Simmons, Oxford Paper Co., New York.
F. T. E. Sisson, Racquette River Paper Co., Potsdam, N. Y.
Geo. W. Sisson, Jr., Racquette River Paper Co., Potsdam, N. Y.
Lewis H. Sisson, Racquette River Paper Co.
Rufus L. Sisson, Racquette River Paper Co., Potsdam, N. Y.
H. J. Skinner, Skinner, Sherman & Esselman Corp.
A. F. Smith, General Electric Co.
Carlton Smith, Miamisburg Paper Co.
D. A. Smith, District of Columbia Mfg. Co., Washington, D. C.
E. H. Smith, Paper Makers Importing Co., Inc.
E. C. Smith, Nashua Gummed & Coated Paper Co., Nashua, N. H.
F. L. Smith, New York.
R. W. Smith, Bird & Son, Inc., East Walpole, Mass.
W. R. Smith, Keith Paper Co., Turners Falls, Mass.
A. Southan, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.
Edward Southworth, Southworth Paper Co., Mittineague, Mass.
Geo. P. Southworth, Stecher Lithographic Co.
Meldin D. Southworth, Southworth Co., Mittineague, Mass.
G. K. Spence, New York & Pennsylvania Co., Johnsonburg, Pa.
C. W. Spickerman, Whiting-Plover Paper Co., Stevens Point, Wis.
Spangler Spurgeon, Schmidt & Ault Paper Co., York, Pa.
S. A. Staege, Westinghouse Electric & Mfg. Co.
H. W. Stark, Rexford Paper Co.
L. M. Start, Rice, Barton & Fales.
B. K. Steadman, Stanton Paper Mfg. Co.
J. H. Steinmetz, Bedford Pulp & Paper Co., Richmond, Va.
J. N. Stephenson, Pulp & Paper Magazine of Canada, Montreal, Que.
R. H. Stevens, Bogalusa Paper Co., Bogalusa, La.
A. J. Stewartson, Sec., Wrapping Paper Mfrs. Service Bureau, New York.
Henry W. Stokes, York Haven Paper Co., York Haven, Pa.
R. R. Stoltz, Westinghouse Electric & Mfg. Co.
Austin P. Story, Chillicothe Paper Co., Chillicothe, Ohio.
V. M. Stouck, New York & Pennsylvania Co.
Kimberly Stuart, Neenah Paper Co., Neenah, Wis.
R. Y. Stuart, U. S. Forest Service.
Stanley O. Styles, Martin Cantine Co., Saugerties, N. Y.
B. S. Summers, Port Huron, Mich.
S. W. Suter, Champion Coated Paper Co., Hamilton, Ohio.
Edwin Sutermeister, S. D. Warren Co.
D. Manson Sutherland, Jr., Consulting Chemical Engineer.
K. A. Swenning, Mead Pulp & Paper Co., Chillicothe, Ohio.

Those Who Attended the Convention

P. D. Switzer, Bird Machine Co., South Walpole, Mass.

T

P. W. Tallon, Hummel-Ross Fibre Corp., Hopewell, Va.
Mr. Thanhauser, Ideal Cup Corp.
V. L. Tankard, Bayless Mfg. Co.
F. E. Taylor, Advertisers Paper Mills, Holyoke, Mass.
H. S. Taylor, Montreal, Que., Can.
J. W. R. Taylor, Canadian Westinghouse Electric & Mfg. Co.
H. R. Telfer, Detroit Sulphite Pulp & Paper Co., Detroit, Mich.
John W. Teller, Voorhees Rubber Mfg. Co.
George Teren, American Writing Paper Co., Holyoke, Mass.
E. L. Tewksbury, Stowe & Woodward Co.
W. H. Theroux, Paper & Textile Machinery Co., Sandusky, Ohio.
James Thompson, U. S. Envelope Co., Springfield, Mass.
L. A. Thompson, Paper Makers Chemical Co., Holyoke, Mass.
A. B. Thorpe, Franklin Paper Co., Holyoke, Mass.
C. B. Thorne, Riordan Co.
Reed B. Timmers.
C. W. Townsend, U. S. Envelope Co., Springfield, Mass.
John Traquair, Mead Pulp & Paper Co., Chillicothe, Ohio.
E. F. Troop, P. H. Glatfelter Co., Spring Grove, Pa.
E. C. Tucker, Chemical Paper Mfg. Co., Holyoke, Mass.
H. H. Turner, Defiance Paper Co., Niagara Falls, N. Y.
P. Y. Tumy, General Electric Co.

U

A. D. Unger, Continental Paper & Bag Mills Corp.
D. D. Uong, Fitchburg Paper Co., Fitchburg, Mass.
S. A. Upham, Brownville Paper Co., Brownville, N. Y.
Chas. Upson, Upson Co., Lockport, N. Y.
T. M. Uptegraff, Defiance Paper Co., Niagara Falls, N. Y.

V

J. B. VanHorn, Holyoke Card & Paper Co., Springfield, Mass.
C. D. Viergiver, Stecher Lithographic Co.

W

J. M. Wade, General Electric Co.
C. K. Wadham, Z. & W. M. Crane, Dalton, Mass.
George R. Wadleigh, West Virginia Pulp & Paper Co., New York.
C. L. Wagner, J. O. Ross Engineering Corp., New York.
Guy Waldo, Flambeau Paper Co., Park Falls, Wis.
E. C. Walker, Collins Mfg. Co.
H. G. Walker, Western Electric Co.
J. J. Wall, General Electric Co.
Geo. R. Wallace, Jr., Fitchburg Paper Co., Fitchburg, Mass.
Thos. Compton Walsh, Hollingsworth & Vose Co., Boston, Mass.
A. N. Waring, Bayless Mfg. Corp.
J. M. Ward, Detroit Sulphite Pulp & Paper Co., Detroit, Mich.
T. F. Warren, Warren Parchment Co.
W. J. Warren, Hampden Glazed Paper & Card Co., Holyoke, Mass.
M. C. Warwick, American Waxed Paper Association, New York.
H. D. Waterbury, Hooker Electrical Chemical Co., New York.
R. S. Watson, Allis Chalmers Mfg. Co.
Russell Watson, Banzhaf & Watson.
W. T. Webster, Dill & Collins Co.
W. J. Weed, Electro Bleaching Gas Co.
John Wefring, Waterfalls Paper Mills.
P. F. Wehmer, Electrical Testing Laboratories, New York.
Dr. Gerald Wendt, Penn State College.
K. F. Wenz, Champion Fibre Co., Canton, N. C.
John A. Wesley, Rhinelander Paper Co., Rhinelander, Wis.
R. Westad, Borregaard Co., New York.
J. Westegaard, Atterbury & McKelvey Co., New York.
D. P. Weston, Esleeck Mfg. Co.
Donald Weston, Byron Weston Co., Dalton, Mass.
Harry E. Weston, Thomas H. Savery, Jr., Chicago.
Philip Weston, Byron Weston Co., Dalton, Mass.
W. E. Westveld, N. E. Forest Experiment Station.
Byron B. Wheeler, E. Butterworth Co., New York.
P. B. Wheeler, Franklin Paper Co., Holyoke, Mass.
Geo. W. Wheelwright, Geo. W. Wheelwright Paper Co., Leominster, Mass.
R. B. White, White-Washburn Co.
A. R. White, Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
R. B. White, White-Washburn Co.
R. A. Wilkins, Bird & Son, Inc., East Walpole, Mass.
W. N. Wilkinson, Supply & Equipment Association.
W. R. Willets, Oxford Paper Co.
F. M. Williams, Williams Apparatus Co.
W. V. Williams, Beckett Paper Co., Hamilton, Ohio.
G. E. Williamson, Strathmore Paper Co., Mittineague, Mass.
Peter Williamson, Beaver Wood Fibre Co., Thorold, Ont.
S. L. Willson, American Writing Paper Co., Holyoke, Mass.
Elwood Wilson, Laurentide Co., Ltd.
H. A. Wingate, C. H. Dexter & Sons, Windsor Locks, Conn.
F. E. Winslow, General Electric Co.
F. E. Winslow, General Electric Co., Schenectady, N. Y.
Cris L. Winter, Claremont Paper Co., Groveton Paper Co.
R. B. Wolf, R. B. Wolf & Co., New York.
Fred F. Wood, U. S. Envelope Co.
Fred P. Wood, Simplex Paper Corp.
L. G. Wood, Northern Paper Mills.
Robert Woodhead, W. H. Vinton & Son, Brattleboro, Vt.
J. B. Woodruff, Holyoke, Mass.
T. S. Woolsey, Jr., Consulting Forester, New Haven, Conn.
J. F. Wuenschel, Hammermill Paper Co.

Y

Leon M. Yoerg, American Writing Paper Co., Holyoke, Mass.
D. C. York, Oxford Paper Co.
J. D. Young, Edgewater Paper Co.
E. F. Yulke, Continental Paper & Bag Mills Corp., New York.

AMERICAN WRITING OFFICIALS DINE

A dinner was held Tuesday night of last week to 100 executives, superintendents, department heads and chief clerks of the American Writing Paper Company at the Hotel Nonotuck at which President Sidney L. Willson of that Company took occasion to thank the "men along the line" and said he was certain that the splendid teamwork and spirit would continue and put the company at the top of the paper world and keep it there.

"When I came to this city four years ago," said President Willson, I felt that I was among a number of strangers but now I know I am among friends who are cooperating with me to elevate the name of the American Writing Paper Company high up in the paper world."

"Conditions were very critical in the company four years ago; but today, following the good work and cooperation of those in this gathering, it has pulled itself away from these conditions and risen to a very high standing. I want you members of this great American Writing Paper Company family to know how much you have done for the company and for me personally. It is not alone the bond and stockholders of the company who have brought back the old reputation of the company but you men along the line with your ever-prevailing spirit of cooperation."

Former Mayor John J. White said that he was in the city at the birth, death and resurrection of the American Writing Paper Company and that the resurrection was a most remarkable one. He compared President Willson with a field general who had guided his men through thick and thin. In closing he said: "For the first time since I was mayor of this great city, I have the sincere wish that I could hold that position for five minutes so that as chief executive and in behalf of the citizens of Holyoke I could congratulate President Willson and the personnel of the American Writing Paper Company for their work in raising and establishing the reputation of the American Writing Paper Company in the paper industry."

PULPWOOD CONSUMPTION IN 1925

The Department of Commerce announces that, according to data collected at the annual canvass of pulp mills, the total quantity of pulpwood consumed by 142 mills in 1926 was 4,022,813 cords, an increase of 10 per cent as compared with 3,656,838 cords consumed by the same mills in 1925. The production of wood pulp by these mills in 1926 amounted to 2,478,102 tons, an increase of 10.7 per cent as compared with 2,237,602 tons in 1925. These 142 plants consumed about 60 per cent of the total quantity of pulpwood used in 1925. Assuming their proportionate consumption in 1926 to have been the same—that is to say, 60 per cent of the total—an aggregate consumption of 6,705,000 cords during the latter year is indicated. The corresponding total for 1925 was 6,093,821 cords.

In this comparative statement, which covers about 60 per cent of the total number of active mills, 19 States are represented. As soon as returns are received from all establishments a report giving complete figures will be issued.

The figures for 1926 are preliminary and subject to change if necessary.

The following statement compares the consumption of pulpwood and the production of wood pulp for 1926 and 1925:

COMPARISON FOR 142 IDENTICAL MILLS: 1926 AND 1925

	1926	1925	Per cent of increase
Cords of pulpwood consumed	4,022,813	3,656,838	10.0
Tons of wood pulp produced	2,478,102	2,237,602	10.7

Compiled by the Bureau of the Census, Department of Commerce, in cooperation with the Forest Service, Department of Agriculture.

Technical Association Papers and Reports

Presented at the Annual Convention of the Technical Association of the Pulp and Paper Industry at the Waldorf-Astoria, New York, February 22 to 24, 1927—Representative Men of the Pulp and Paper Industry Throughout the Country Discuss Numerous Important Problems of Timely Interest.

Pulp and Board from Steam Exploded Wood

By W. H. Mason *

Masonite is a trade name adopted for products made from sawmill wood waste by a process which, through the use of saturated steam at high temperature and pressure, explodes the wood chips and produces a resultant wood pulp consisting of long fibers encrusted with the original wood lignins.

This has permitted the development of an entirely new commercial product, Presdwood, an extremely hard and durable board of great tensile strength, in which, by means of compression at a predetermined temperature, the wood lignins are made to serve as a binder to reweld the fibers in a compact mass.

A second commercial process that has been developed from this exploded pulp is the manufacture of an insulating board, which follows the usual process of manufacture up to the drying stage. Here it is handled in a hydraulic press, instead of through drying rollers, and by different variation in temperature and pressure from that used for the "presdwood," is given a hard compact surface on either side, with the insulating qualities preserved in the central mass.

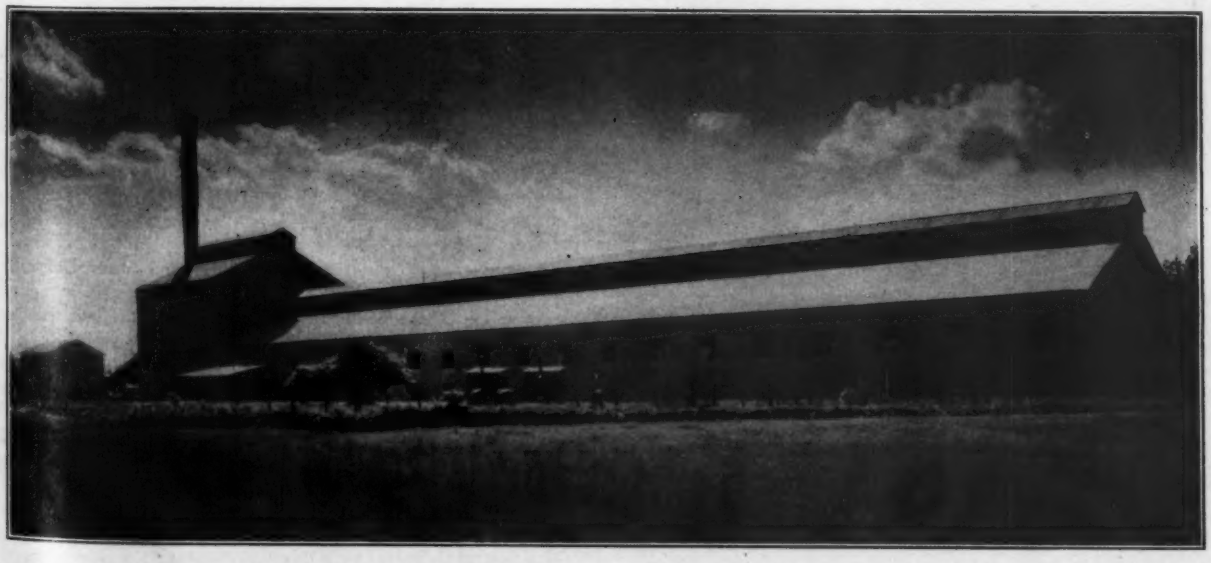
By the use of the steam exploding process the high power cost, and the laceration of fibers entailed in the mechanical grinding process, and the loss of 40 to 50 per cent of the material, which results from the chemical pulp process are avoided. The proper combination of degree and duration in temperature results in virtually complete separation of the wood fibers without noticeable deterioration in either the cellulose or lignin.

It will be interesting to paper manufacturers and engineers to know that the wood pulp first produced experimentally by the explosion process was immediately thought of as a possible source of raw material for papermaking. However, the first experiments along this line did not give as good results as experiments in other directions, and as a result little has been done with the material along papermaking lines.

Since the Masonite process was announced, considerable interest has been manifested in the possibilities of the exploded pulp by the paper interests, and some experiments are now being conducted, but are not completed at this time.

It is natural that the paper manufacturers would display a keen interest in this process, since it uncovers a practically new source of raw material for them; the saw mill waste which hitherto for reasons familiar to paper men, has not been well adapted to the paper industry. Some of the questions that are doubtless in

* Vice president Mason Fibre Co., Laurel, Miss.



PLANT OF MASON FIBRE CO., LAUREL, MISS., WHERE WOOD WASTE IS DEFIBERED BY STEAM PRESSURE AND CONVERTED INTO HARD BOARD AND INSULATING MATERIAL.

your minds can be answered best, I believe, by a detailed account of the experiments leading up to the commercial production of Masonite products, including a description of the mechanical equipment of the plant of the Mason Fibre Company at Laurel, Miss.

Preliminary Experiments

As to the inception of the idea for Masonite, I was engaged several years ago in perfecting and operating a process for the extraction of rosin and turpentine from sawn boards, so as to recover valuable byproducts and at the same time raise the grade of the lumber. In my travels from one Southern mill to another, I was impressed with the great waste of raw material in the forms of slabs, edgings, board ends and sawdust which were sent into the great trash burners for disposal.

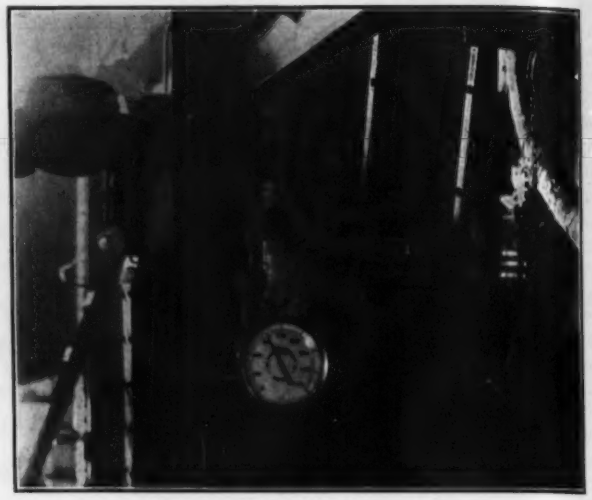
The idea of finding some means of converting this waste wood into wood pulp took form. The mechanical grinding process was considered, but was discarded for the reason that power costs are high in this operation, and the gums of Southern pine woods quickly impair the efficiency of the grinding surfaces.

The chemical process was also rejected because of the loss of 40 to 50 per cent of the raw material in the digesters, the high cost of a commercial plant, and the difficulty of handling the bark on the slabs and edgings, a difficulty, of course, with which all paper men are familiar.

The idea was always kept in mind that in working with a raw material of practically no present value, some process of a comparatively inexpensive nature must be evolved in order to ensure commercial success.

The problem then resolved itself into the practicability of separating the fiber without losing the lignins. It occurred to me that wood being plastic when subjected to heat and moisture, and this plasticity probably being due to some change in the lignins under those conditions, it might be possible to soften the lignins

SAW MILL WASTE FROM WASAU SOUTHERN LUMBER CO., GOING TO MASON FIBRE CO., AT LAUREL, MISS.



READY TO EXPLODE THE CHIPS FROM THE STEAM GUN.

and blow the fibers apart with the same steam that had been used to soften the wood.

Four Phases of the Problem

There were four phases of this problem to be considered.

1. Application of temperature and moisture in such manner as to soften the lignins more than the cellulose fiber.
2. Means of releasing the steam practically instantly.
3. Application of the temperature in such manner as not to char or deteriorate the fibers.
4. The degree of pressure that would be necessary to disrupt the fibers at the time the pressure was removed.

The question of a working pressure came first. I knew it could not be done with 150 to 200 pounds, but just how much pressure was required I hadn't the faintest idea.

At that time—in the spring of 1924—I had a turpentine extraction operation at the plant of the Wausau Southern Lumber Company at Laurel, Miss. My experimental plant was in an old shed adjoining the sawmill plant, and my first steam gun was a piece of old shafting some three inches in diameter and about fifteen inches long.

In one end of the shafting we bored a hole, which was enlarged inside in cylindrical form to a dimension about twice as large as the size of the neck through which the boring was made. In one side of the shafting another small opening was drilled and a brass cup fitted on the inside of the cylinder and filled with oil, so as to make thermometer readings possible.

The outside of the gun muzzle was tapered to a ground valve joint and the valve was held in place by a round-necked pin, supported in turn by a yoke surrounding the gun and bolted to the breech.

The gun chamber was filled with chips and water, the valve placed in the breech opening, and the pin drawn back against the valve by tightening the bolts in the rear of the gun, holding the yoke firmly against the pin.

Two gasoline torches were then directed against the side of the gun until the temperature on the inside rose to 480 degrees Fahrenheit, indicating a pressure of approximately 600 pounds. A four-foot long bar was placed with one end against the pin and a sharp blow with a hammer on the other end of the bar knocked the pin loose and allowed the valve to blow out.

The First Experiment a Success

The first experiment with this makeshift gun was a complete success, so far as the defibering of the chips was concerned, although it took a long time to find the valve. The principle of

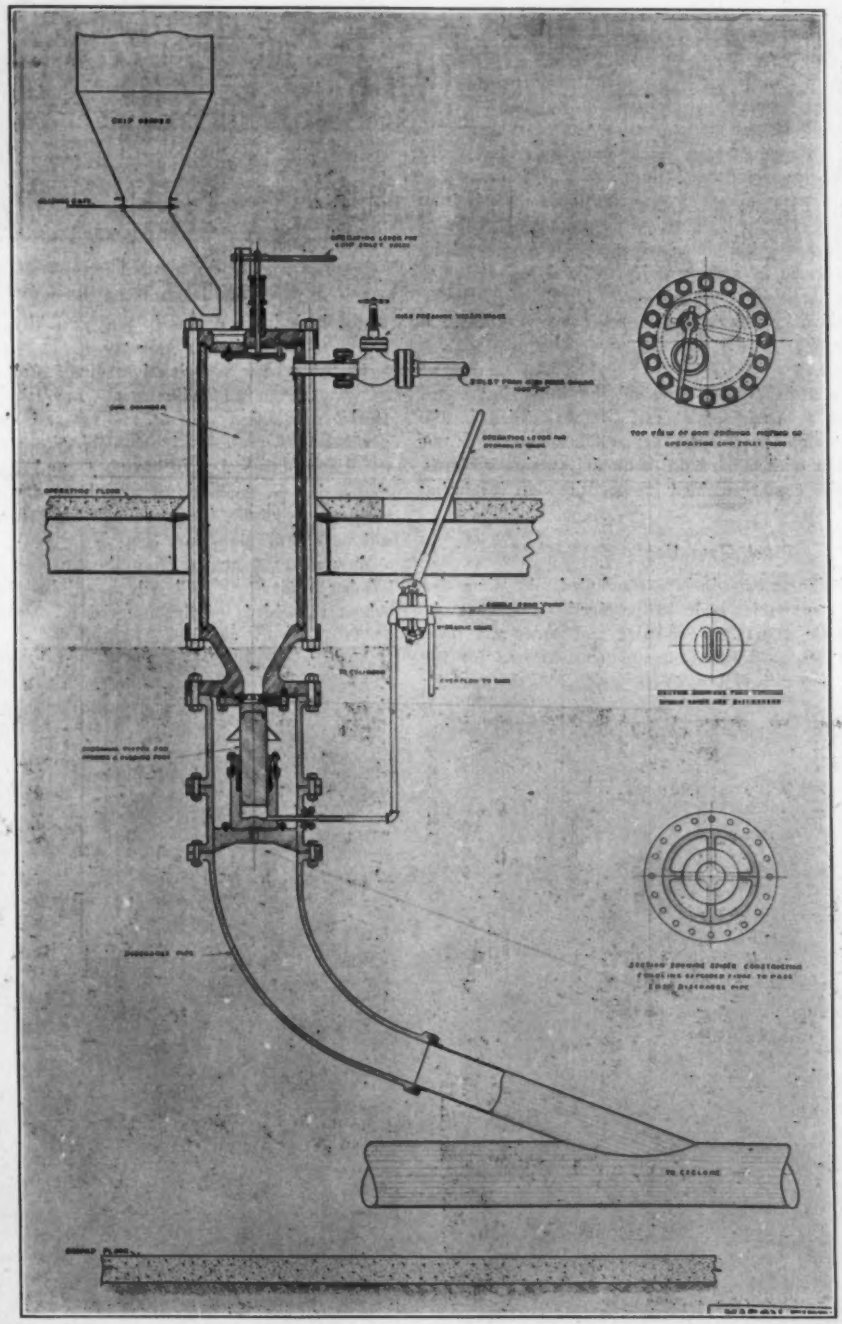
steam explosion had been demonstrated at the first trial. For the rest it was a matter of continual experiment to establish the best working pressure and proper degree of temperature and time.

For some weeks this experimental gun was used, during which time different kinds of wood were discharged from the muzzle, at varying pressures. We even tried to make white wood fiber, but there was always some darkening caused by the steam. Subsequently, two other experimental guns were constructed, in which pressures as high as 900 pounds were utilized. It was determined that the time element was just as important in exploding the chips as the steam pressure and temperature inside the gun.

In present practice we subject the chips to a low pressure of 200 pounds for from 10 to 15 seconds, and then to a pressure of 1,000 pounds for from 3 to 5 seconds, before blowing them from the gun. This softens the lignins without damaging the fiber. We can apply the higher pressure direct for 6 seconds and obtain complete separation of the fiber, but the resultant pulp is not as good.

Having worked out a method of defibering the sawmill wood waste, the next step was to find the best product to be made from the raw material. I took some of the fiber to the plant of the Bogalusa Paper Company at Bogalusa, La., where it was beaten up and made into a small sheet of paper by hand. The result did not look very good, so that attempt was dropped and another use sought for the material.

I might say here that one reason why some other product was desired arises from the great amount of waste wood material available and the necessarily limited market for the present paper products when considered in relation to the large supplies of raw material.



Cross Section of Mason Fiber Gun Showing Details of Construction and Plant Arrangement

Masonite Insulating Board

In looking over the various types of wood products to which the new raw material might be adapted, insulating board seemed to offer a natural outlet, due to the fact that the bundles of fibers from the steam explosion process give the puffiness, the loose structural characteristics and the minute air cells required for this class of work.

A beater was made out of an old gear, using angle iron for a bed plate. The fiber was exploded from the experimental gun, worked over in this beater, formed into a board by hand, compressed to one-third density in an old letter press, and dried in an oven.

While experimenting with the insulating board we also tried out a hydraulic jack, which was used by the Wausau Southern Lumber Company as a wheel press. With this we compressed the material using a pressure as high as 5,000 pounds per square inch, but while the resulting board was fairly hard it did not show any characteristics out of the ordinary, so the experiment was temporarily abandoned.

Still continuing the experiments with the insulating board, we sent a carload of fiber to the plant of the Marathon Paper Mills Company at Rothschild, Wis. Here we constructed a small home-made fourdrinier 18 inches by 15 feet long, and used their beaters to handle the material. The perfecting of the insulating board proceeded satisfactorily.

Meanwhile the idea of a hard-

board had not be abandoned. We found a steam heated press which was used for making water-marked dies, put some of the insulating board in it for further compression, and shut off the steam. Then we went back to the fourdrinier to continue an experiment there, forgot about the board in the steam press and went off to dinner.

Hard Board—Presdwood

When we came back we found the press was hot, owing to a leak in the valve. Opening up the press we were much surprised to find a hard dense board, stuck to the belts and very imperfect in form, but nevertheless possessing qualities that appeared to be unusual.

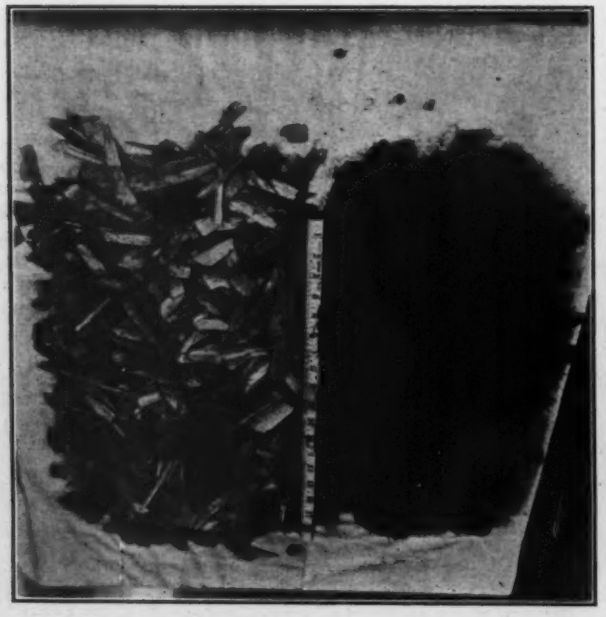
This opened up another big field for experiment, and delayed for some time the use of the exploded fiber on a commercial basis. Returning to Laurel, Miss., we built a screw press with steam-heated platens, both top and bottom, and after four months of work finally evolved the right combination of fineness of the pulp, pressure in the press, and temperature of the platens.

One of the hardest problems was to keep the board from sticking to the platens, but solving this was merely a matter of technic, which has been worked out satisfactorily. We also found that the secret of success in making uniform hard board was to follow up with the pressure as the material shrank in the press. While the compression capacity of the press was very high, it was discovered that 300 to 400 pounds per square inch gave a good working basis.

A final development in the handling of the insulating board followed, almost as a matter of course. It was dried in the press, instead of through the roller drier, and not only came out in good condition, but with a hard finish on the outside surfaces, while the mass in the center retained its porosity and insulating qualities.

Plant Operation

With these preliminary experiments concluded, the time for testing them on a commercial scale had arrived. The data obtained was laid before a group of lumber and paper-mill men, and as a result the Mason Fibre Company was formed for the purpose of building a plant. The venture was amply financed by



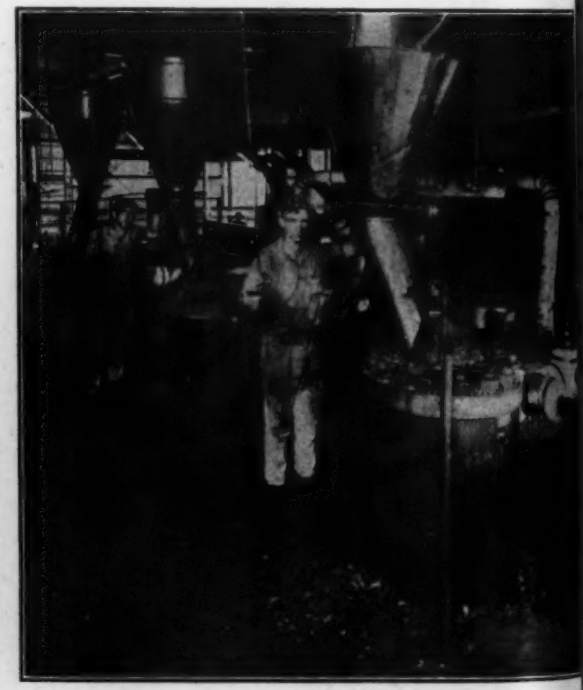
LEFT—CHIPS AS INTRODUCED INTO THE GUNS. RIGHT—THE FIBER AS IT COMES FROM THE GUNS.

CYCLONE AND STOCK CHEST INTO WHICH THE EXPLODED FIBER IS DISCHARGED FROM THE GUNS.

men whose interest was in the possibility of the utilization of a waste product of their industry.

The plant was completed in June, 1926, and after two months of experiments and adjustments, operations began in September. Initial production was at the rate of about 2,000 square feet per hour of presdwood and Masonite structural insulation for the first month, the plant having a rated capacity of 100,000 square feet a day on the basis of a 24-hour day operation. Production has been gradually increased and for January will run close to a million and a half square feet.

Raw material comes from the saws of the Wausau Southern Lumber Company's mill, which adjoins the Mason Fibre Plant. About two-thirds of the material is now used under our boilers



TURNING ON THE HIGH STEAM PRESSURE AFTER LOADING THE GUNS WITH CHIPS.

for fuel, but if and when the economy of other forms of power is determined, substantially all of this mill waste will be available for fiber.

The material goes into a hog where it is cut into chips, and afterwards screened to substantially the same size as used in an ordinary paper mill; the chips are fed into the guns—of which there are three, each having a capacity of 200 pounds green chips. The charging valve is closed and high pressure steam valve opened until the pressure in the gun is about 200 pounds. This is held about 15 seconds and the full steam pressure of 1,000 pounds is turned on—in 4 or 5 seconds the discharge valve is opened and the chips forced out, exploding into fiber as they pass the ports.

The velocity, estimated at 4,000 feet per second, carries the fiber to the cyclone separator and the steam escapes to the atmosphere. The fiber drops into a stock chest.

Steam for exploding the chips is generated in a 400 horsepower Babcock and Wilcox boiler. The tubes are 2 inches diameter and ⅛ inch thick. The drum is made from a solid steel gun forging 4 feet in diameter and 4 inches thick. The heads are placed in the drum and then each end is drawn down bottle shape, until the opening is 18 inches, and it is impossible to remove the manheads while the boiler is under pressure.

HYDRAULIC PRESSES, 2,000 TONS COMPRESSED CAPACITY, PRODUCING 1,000 FEET OF MATERIAL EACH, PER CHARGE.

Manufacture of the Board

Water is added to the fiber in the stock chest so it can be drawn out to the Wiener refiners. This is a new machine designed by John A. Wiener, superintendent of the plant, and is somewhat similar to a jordan in principle, except the material enters at the large end and is discharged from the small end. There are five of these machines—some used in parallel and some in series so some of the stock receives more refining than the average.

The refined stock passes to the fourdrinier, which is 5 feet wide and 36 feet long, with three pairs of press rolls. Close to the breast roll is a suction box underneath the wire, and a top felt over the sheet. The sheet is formed between the felt and the wire and is about 2 inches thick. In passing through the press rolls, this is reduced to about ¼ inch thick. Then it is automatically cut into twelve-foot lengths and is fed by a tipple feed to the racks.

Each rack holds twenty sheets, or about 1,000 square feet. These racks are on wheels and are pushed to position at one end of a press.

Four presses are required to handle the product. Each press contains twenty-one steam heated platens. The wet sheets are drawn in between the platens on wire cloth, and the press closed. These presses are operated by three hydraulic rams 50 inches in diameter and each press is capable of exerting a pressure of 2,000 tons.

GENERAL VIEW OF FOURDRINIER, WITH SPECIALLY DESIGNED FLOW BOX AND NEARBY THE HYDRAULIC PRESSES.

In making an insulation board, the time in the press is from 50 to 60 minutes. When making presdwood, the time is about 25 minutes.

When formed on the fourdrinier, the board may be made into either a 7/16-inch thick insulating board, or a ⅛-inch presdwood, depending on the process of handling in the presses.

Each charge of a press produces approximately 1,000 square feet of board and when the press is discharged back into the empty rack, the boards are finished except cooling and trimming.

Characteristics of the Presdwood

It is not necessary to refer here to the uses of Masonite structural insulation. The "presdwood," however, possesses some very unusual qualities which have already won for it a wide variety of uses.

Its great denseness, stiffness and hardness may be cited. While subject in a limited degree to moisture, being a wood product, its resistance is such, that the small absorption that does take place does not affect its hardness appreciably. It has a tensile strength of from 4,000 to 5,000 pounds per square inch, equal to many woods with the grain. Since this product, however, has no grain, the fibers being indiscriminately mixed, its tensile strength is equal in all directions, whereas in ordinary wood the strength across the grain is only about one-tenth as much.

One of its biggest uses at present is as lining for automobile doors; for desk tops, card tables, radio cabinets, wallboard and paneling and other specialized lines. It comes from the hydraulic press with one side smooth and polished, and can take any finish that can be applied to ordinary wood.

There are other prospective uses for the raw material from which these products are made, and experiments are now being conducted to establish them on a commercial basis.

This paper would not be complete without mentioning the valuable assistance given me by D. C. Everest, John Wiener and Charles H. Westphalen.

Report of Committee on Training in Industry

By Martin L. Griffin, Chairman

A survey of the pulp and paper industry made a year ago by this committee revealed the fact that very few companies were cooperating with educational institutions or depending upon them to provide personnel for their responsible positions.

A summary report of an investigation by the National Industrial Conference Board, made in 1924, revealed a similar situation. Notwithstanding a very marked growth in sentiment in favor of more education for all classes in the paper industry, it is lagging far behind many other industries in contributing to this end.

The Superintendents' Association is deserving of much praise for promoting education to advance its part in the industry. During the past summer the Miami Valley Division of the American Pulp and Paper Mill Superintendents' Association conducted a notable conference on Foremen Training under the auspices of Ohio State University and the State Board for Vocational Education.

It would be useless to discuss the outworn criticism of college men, that a wide gulf exists between their academic attainments at graduation with the requirements of industry. There is such a gulf which is not their fault. The responsibility rests squarely upon all institutions of learning for the young, and society which must absorb them. There must be studied cooperation between the two.

Cooperation Necessary

It is quite likely true that educators have impressed their judgment upon their students from their view point, while industry and commerce have had to refit them for life's duties because they have failed to cooperate. We should recognize the fact that society has its cultural side as well as its utilitarian, and that sooner or later they will blend. Both are necessary.

At the University of Cincinnati which I visited quite recently, I found the oldest and most conspicuous cooperative plan of part time study and work so well established that it had given up its regular courses of study. Along with the engineering schools, Dean Schneider has integrated the service of a School of Fine Arts to industry. He has long held the belief that the cultural influence of the beautiful can rapidly become widespread in this country only through the beautifying of our articles of every day use. To accomplish this, art must be introduced into all manner of industry.

In 1925 he organized a basic research laboratory which may have a remoter bearing on industry, yet its effect may, in the end, be more important than the results of the others. Already the university is becoming the center of applied research, two laboratories haveing quite recently been established by industry, one of them related to paper,—the Lithographic Technical Foundation.

The theory upon which these activities have been based may be expressed as follows—"Industry is the agency through which the majority of Americans work out their individual welfare. It is also the chief agency through which we are trying to lay a material foundation upon which to build a civilization high in spiritual values. The University—a leader of men,—has, therefore, the obligation to assist at every possible point, so that industry may, as rapidly as possible, work out its salutary mission for the whole people." Here then is a real university of human service.

Guidance Assured

Besides the University of Cincinnati, there is the University of Pittsburgh and Northeastern University of Boston which are the most conspicuous in this field besides many smaller institutions. From the day a student enters one of these he is under careful guidance to be assured he is not a misfit any where along the road.

The Chairman of this Committee has visited each of these three large universities and made a careful survey of their activities and heartily commends their work. So far as actual contact with industry is concerned, their students perform their tasks alongside their fellows under all the same conditions, free from jealousies and favoritism, and the reports are very satisfactory.

With such facilities already well established and increasing rapidly, there is little excuse for the old complaint against college trained young men, if industry, the paper industry, will make its needs known to these cooperating universities and do its part.

It should be distinctly understood that the standards of scholar ship and the requirements for a degree are as rigid in these cooperating schools as in others.

To those graduates of the usual colleges and universities who enter industry without experience, this Committee would advise you to arrange for part time work in a plant, alternating if possible with some fellow student. At any rate, get into the plant on the same basis as those who are regularly employed, if you wish to take broader responsibilities.

Specifically, this report aims to inform the paper industry where and how to obtain and build up an educated and trained personnel for its mills, without expense, by applying to and cooperating with some one of these growing part time work and study schools.

The Technical Man's Field

By Arthur B. Green*

The important part of any technical problem comes after it has been solved. It is one thing to bring a research to issue in a discovery, and quite another to get the mill to make daily use of it. To accomplish the first a competent man, with freedom to pursue the problem, some appropriate apparatus, and a statement of the problem, are all the are needed. But the second is not accomplished without changing habits, disturbing notions that have long been held in austere and commanding minds, readjusting relations between man and man. Our Technical Association has laid small stress on this second part of any technical achievement.

Sixteen years ago the merits and faults of scientific management came blazing into public notice. The burden of the movement, so far as it was new, was exactly the principle just put in free language above. The corollaries, the implications, the consequences, affected industrial management so deeply as to stir men either with high inspiration or with angry denunciation, according to their personal vision. The high-tension phase of the movement passed. It left a trail of smaller endeavor and cheap commercialization carried on by the manufacturer who saw in it good advertising, and by the outsider who saw in it a charlatan's living. The sweep of the tide in its flood, and also the subsiding ebb, both failed to affect in any widespread manner the thought or the practice of the paper industry.

Frederick W. Taylor a Pioneer But a Poor Salesman

In January, 1912, Frederick W. Taylor, more responsible than any one else for applying engineering to management, gave his testimony before the Special Committee of the House of Representatives. The proceedings were published last August by the Taylor Society. They make wonderful reading for any one with a serious purpose in the running of his mill. In a few pages before the testimony itself there is an editorial by Dr. H. S. Person, in which he says:—

THE BEATER DRAG
Showing one method of raising out of the way of Rake and Paddle.

"Taylor was not skilled as an expounder. . . . As an advocate he was even less skillful. His public addresses are on the whole paraphrases of his written expositions. They are interesting and substantial but they carry no fire of persuasion. . . . Nevertheless, the testimony printed in this issue is one of the most important documents in the entire field of management literature."

This great engineer, chief servant and prime minister to men who are charged with directing other men in industry, was in the language of today a "poor salesman" and was not good at "getting his stuff across." He was only the pioneer. He took chances. He forgot himself and went seeking out the truth. He cared little where that might lead. He had done the thinking. But if in addition he was not also a self-salesman that was a reason why the virtue of his work should not be grasped. If it be counted a weakness that he could not barn-storm, what should be said of those who waited to be sold? With all the inspiration, all the opportunity, all the responsibility, that goes with the job of manager, why should anyone sit down and wait for a salesman?

THE BEATER DRAG WITH AUTOMATIC RECORDER
Shown in working position.

Precision Possible in Paper Making

One of the things that is certain about paper making, just as certain as it is in any other industry, appearances to the contrary notwithstanding, is the possibility of precision. When enough facts are known, or when the right facts are known, precision will follow. But before that can come about there is the other certainty, common also to every industry, which is that enough facts, or the right facts, for opening up this possibility of precision, will hardly be brought into the manager's office in a samplecase. The problem is a call to action. So long as it suffices to say "I have not yet been fully sold," everything is excluded except what is obvious and on the whole pleasant. Nor can any one expect, as long as that is his case, to achieve anything that is not equally open to his competitors. But this possibility of precision in making paper challenges. Shall we accept?

The present writer had the honor of reporting to this Association just ten years ago this month the great possibility of beating stock for making paper with precision. This was at the second annual meeting of the Technical Association. The paper carried the title, *"Management of the Beater Room,"* and appeared in *"Paper,"* Vol. XIX, No. 23, dated February 14, 1917. The methods set forth were introduced in the opening sentence as composing the "first plan in the writer's knowledge whereby the process of beating may be subjected to precise control." It will serve the present purpose just to epitomize very briefly what was said at that time, in order to get before us the practical problem and what may be done to solve it.

TAPPI SECTION, PAGE 84

* Member TAPPI, Middletown, Ohio.

Precise Control of the Beating Process

The problem was set at the beginning in two parts, the technical part and the human part. The technical part was put in for a purpose, namely, "to develop *means whereby the management can give to the beaterman and his helpers definite duties to perform, which can be understood and measured by a competent person not himself doing the work, the result of which will be greater uniformity in the treatment of the stock.*" A good many attempts had already been made to reduce beating to measurement by examining the fibers under the microscope, by analysing chemically the fibers themselves and the changes they undergo in course of being beaten, by studying in minute samples the various reactions that may take place between the constituents of the furnish while undergoing the punishment of beating. These attempts had led nowhere. Study in these directions seemed to get increasingly involved. It was not possible by such means to obtain a practical view, to deduce guiding principles, within any reasonable length of time. Besides these obscure factors there were also very obvious ones, overlooked in the zeal of investigators to uncover something strange. Observing the beater in action, as any visitor to the mill would, there are significant things going on:—(1) The surface slope of the stock is becoming less; (2) The texture of the surface of the stock is progressing from coarse to fine; (3). The speed of turning, or speed of travel, of the stock is increasing; (4) The stock is losing its initial stiffness and coming to work on itself as it travels; (5) There is a change in the "feel" that you get by working the stock between your fingers and the palm of your hand, not altogether covered by the factors already listed; (6) The "flow" of the stock is changing, so that the total pull on an obstacle held in the stream diminishes as the beating progresses. These are obvious factors. Some or all of them must bear a relation to the character and extent of work done on the stock by the beating. When such factors are measured, and their measurement compared with those factors that tell in the working of the stock on the paper machine and in the quality of the final paper, a practical means of control can be expected.

Establishing Means of Measurement

Working with these practical observations, of course it was necessary to devise ways of expressing those properties that are desired in a sheet of paper, ways of measuring them, ways of discovering them in the stock while undergoing the beating, and ways of putting them in accurate units of measurement. It would not do to allow the results to depend on what might come off the paper machine. The mill organization at that stage was skeptical or openly hostile. The condition of the stock as a paper making material must be known in terms that describe paper before the stock is dropped to the chest; and further, there must be some way to trace the changes that take place in these papermaking characteristics from beginning to end of the beating period. Several years of preliminary work had to precede any reliable study of beating itself, and the means of measurement had to be established. That phase of the work was reported to this Association at its first Annual Meeting, in February, 1916.

Immediately the effect of density was encountered. These six factors, and the changes wrought in them by beating, were dependent on the density of the furnish, and it was not possible to obtain comparable results without some way of controlling the density of the mass. Careful tests on this point showed that ordinary methods of beating gave no control of density, that judgment and attention of beatermen and helpers unassisted by good detail precision guidance would give variations in density up to 40 per cent.

It was quite apparent that thinning the stock in the beater would reduce the pull on any obstacle held under the surface, and that thickening the stock would increase such a pull. It was worth finding out whether two furnishes so made as to produce the same pull would not have the same density. As this line of endeavor showed promise from preliminary tests, work was turned toward refining the measurement given by an obstacle held under the surface. There is a theory which has to do with fluids and the frictional elements set up in fluids, which assists in designing an obstacle, for the thing needed is to have whatever measurement you adopt as sensitive as you can make it. Finally an obstacle was developed having the proper shape to show the greatest possible changes in pull from small changes in density, the depth below the surface being always constant.

Effect of Beating on Density

Accordingly, a practice is readily set up for governing the density of the furnish. It depends on this fact, and it is carried out by means of a suitable beater drag together with means of varying the proportion of water to dry substance and means of regulating the depth of stock in the tub while drag measurements are being made. In this simple way the density of furnish is kept within 0.1 per cent absolute, and by preserving this control through to the paper machine the ream weight of the final paper is determined and maintained from the beater room.

Control of Density

Though often overlooked in written considerations of beating, this control of density is the first essential of any control of the beating itself. It remained to find adequate guidance in the setting of the beater roll to make sure that the stuff when ready for the paper machine had been so treated as to form a sheet of continuously uniform character. Just as thinning or thickening would change drag readings, so the effect of roll action would also change them. The more severe the treatment the more rapid the changes. Long continuous study and experiment, employing a small paper machine with single-deck driers for experimental runs, and testing in practice on the commercial mill scale, developed the principle. When the papermaking properties of the stock are plotted out in curves on the same chart with drag reading curves it is found that drag curves, duplicated in form and length, accompany curves of paper making properties alike in form and length. In short, to produce stuff that will make uniform paper drag curves must be duplicated.

Long Research Required

Stating the matter in this summary way makes it seem unbelievably easy, ridiculously simple. Yet the discovery and verification of this law through many trials both on the laboratory and on the mill scale required years of concentrated and expensive research. Its very simplicity invited doubts. Trials were much prolonged, and were entered into with many more misgivings, and were checked and cross-checked much more carefully, than almost certainly would have been imposed upon the enquiry if the law could have been more imposing in its final statement. Obviously this simple law is of vastly more practical importance because it is simple. Moreover, it has now passed more than ten years of mill usage. During that time it has been attacked from many angles, tested under many different circumstances, and remains now more adequate as a governing principle than is any plan of management which employs it. Various theories regarding beating have been advanced and have invited well deserved attention during this period without influencing much the methods or the organization of beater rooms throughout our mills; for the only law which affords a control principle is the one just given.

The Human Side of the Beating Problem

Now, on the human, or organization, side of the problem, there is not so much to be said, but vastly more to be done. Armed with this control principle, the mill has before it something to be carried out that amounts almost to reform. Consider the usual way of giving instructions in the beater room. The beaterman gets a sample, a "furnish," and perhaps a color formula, and all the rest is up to him. As to density of furnish, he gages it by

reel it he is careful, and by general appearance if he is an ordinarily good beaterman. At any rate the management takes no hand in that. Then, as to quality, he sets his roll by the sounding stick as he deems proper for the grade, and no one checks him, and if he himself is not quite satisfied he "doctors" it with the jordan. The management takes no hand in this. But the management has sold the order. If the paper is not right, the management does not know what to do next time because there are no records showing what was done the first time. So the management gives the beaterman a lecture, under circumstances where the beaterman knows under his skin that the lecturer has no idea about what he is talking . Blind leading blind, the repeat order is tackled in just as much darkness as before. Having taken the order the management nominally assumes responsibility for the delivery; but ignorant of the art, the management passes a large part of that responsibility on to the beaterman, who in turn cannot carry it; and there it rests unless the company has a pulp mill on which the beaterman can throw what he cannot carry.

Importance of Records

To appreciate a control principle is to change all this radically. The management can now determine exactly how the order ought to be beaten. There are records that show how it was done before. The beaterman now gets a complete set of instructions showing what density to obtain and what series of drag readings to produce every fifteen or twenty minutes throughout the beating period. He gets a figure that tells him how much water to drop with each engine. He makes his own record automatically. He knows at all times whether he is discharging his whole duty or not, and how well he is doing it. He has a task that requires close attention and a high degree of skill, but he knows that he is capable of both. If he fulfills all his instructions faithfully, and then the paper is not as wanted, the management, not he, is to blame. In short, the control principle makes possible the right division of responsibility between the management and the beaterman. That is why the beatermen like it so much better than the management. More responsibility is assumed by the management. Success from the standpoint of good paper, and success from the standpoint of good industrial relations, are both in direct proportion to the whole-heartedness with which the management will assume that proper share of the responsibility for results that belong it.

Fruits of Research Must Be Applied

The whole of the technical field has not been covered until the fruits of research have been applied to the benefit of those engaged in industry both on the upper and on the lower side, and to the trade for which the industry exists. The important part of any technical problem comes after it has been solved. The important part is to adapt and to change industrial methods and human relationships within the business so that new truth shall govern and fresh knowledge shall bring its freedom to those serving under the unjust and wasteful conditions of guesswork. When the mill incorporates into its fabric a laboratory and employs a technical expert, worthy though that is, it has taken but the first step. When the technical man himself submits a laboratory result, he must not stop there. He must add to his bit of technical engineering a larger contribution in management engineering, the more difficult and the more praiseworthy because it will be opposed by the biggest men in the business, because it will encounter selfishness, politics, and intrigue in high places. It will mark a step forward for our Association when it shall enter upon a purposeful study of the principles of human organization as a fulfillment. Our Association, in order to complete its mission, must undertake those matters of executive management which the Superintendents' Association set out to undertake but never did. The mere technical solution by no means finishes the problem.

To this end may it not be worth while to consider seriously some plan to provide the paper industry with a service which compares with the services now rendered to newer industries with such telling benefit. The research department of the General Electric Company has been responsible for advances in the application and transmission of electric energy of the very first importance. Similarly the research organization of the American Telephone and Telegraph Company has blazed the trail to higher economies and greater services for the industry of electric communication. The DuPont interests have long recognized the value of systematic and persistent research to keep a business forging ahead, with the result that probably no business has ever done more to develop byproducts and to expand into related fields. These are examples of deliberate investigation promoted within the industry, supported by the industry, operated to enhance the earning power of the productive departments. They belong to their respective companies. They serve their various industries in so far as the companies dominate. An exact parallel to them could not so well serve under the conditions of the paper industry, but their example can be made use of and another plan designed for the paper industry that would serve to obtain the same degree of progress.

The Paper Industry and Applied Research

Perhaps a better pattern is suggested by the General Motors Research Corporation. Here is a separate enterprise dedicated to experiment. It is affiliated to, and under the control of, a group of industries contributing to the making of motor cars and trucks. Under its leadership new materials have been developed, improved methods have been perfected, and design of internal combustion motors has been carried to a point well in advance of present practice. Among its personnel are the most noted and highest paid research engineers in the world. There is not a department of the automotive industry that is not touched by its refining influence, and to the promoters looking for newer and better employment of capital it opens fresh enterprise, the manufacture of new products, continual enlargement of service. We have nothing as yet in the paper industry that compares with this. We are not showing the type of forward movement in the paper industry that we see so prominently in these younger industries.

Cooperative Research

Two differences between the paper industry and those industries supporting advanced research methods on a large scale cannot be overlooked. There is probably no single company among paper makers that feels itself able to support by itself a research program like these immense ones just cited. Secondly, it is doubtful if the results of research would be so heartily welcomed, so eagrly sought, as where tradition is less established and competition is more clearly based on excellence of service. But we may hope that some at least of the businesses included in our own great industry would co-operate with each other as shareholders in a corporation dedicated to research and to the application of the results in the constituent mills. Such a corporation could well be set up, financed like any other corporation, managed in the joint interest of constituent companies, selling a definite product in the form of expert service, patentable invention, exclusive process, service in management engineering to apply new methods in mill practice and to design organizations to utilize new possibilities in precision. The research corporation would have an income from its services on which to operate and to pay for the use of its capital. To promote a plan such as this would be a stimulating mission for our Technical Association. It is a large task. But it is not greater than the abilities we have among our members to apply to it. During this coming year let us set about getting the necessary facts, and getting our plan in shape. There is not the least doubt that the paper industry would respond in handsome measure to a well laid plan.

TAPPI SECTION, PAGE 86

Transportation of Pulp Through Pipes

1. Pumping Groundwood Eleven Miles

By G. D. Bearce

The Anglo-Newfoundland Development Company, Ltd., has installed and is operating one of the most interesting and outstanding pulp conveying systems in the paper industry on this Continent. This installation is an eleven mile groundwood stock line that transports the pulp from Bishop's Falls to Grand Falls, Newfoundland.

Present Operation

The Angle-Newfoundland Development Company, Ltd., which was built by the Lord Northcliffe interests and is now controlled by Lord Rothermere and the London Daily Mail, located in the Exploits River at Grand Falls on the northwest side of Newfoundland. The Grand Falls mill is a complete unit having a power development, groundwood and sulphite mills, and six paper machines that produce approximately 300 tons a day. Some of this paper is special news grade used in the London Daily Mirror or Daily Mail and most of it is shipped to England. Eleven miles down the Exploits River at Bishop's Falls the company has a groundwood mill equipped with eighteen pocket grinders for 30 inch wood. Until about two years ago all of the pulp made at Bishop's Falls was lapped and transported by the railroad to Grand Falls where it is used in the paper mill. It was decided to put in a pipe line and pump the stock in order to eliminate the cost of transportation and the difficulties in handling and storage. The distance between Bishop's Falls and Grand Falls is approximately 11 miles and the difference in level of the two plants is about 140 feet.

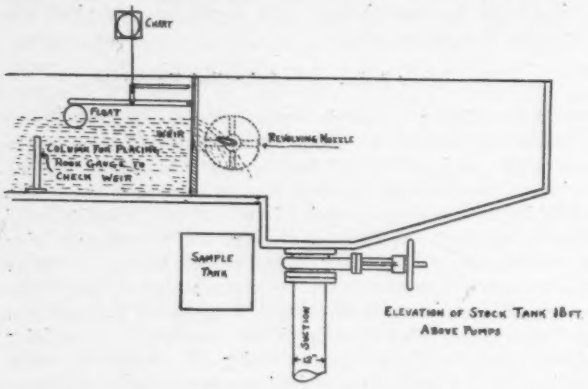


FIG. 1
Weir and Stock Tank at Bishop's Falls.

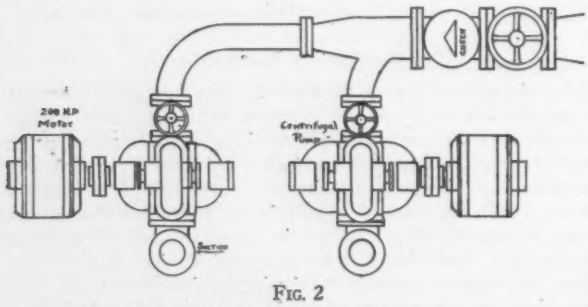


FIG. 2
Plan of Pumps and Piping at Bishop's Falls.

At the present time the groundwood mill at Bishop's Falls produces approximately 80 to 90 tons of groundwood pulp per day. The stock goes from the grinders to a weir and stock tank (Fig. 1) where it is measured. The weir is 25¼ inches wide and the height of liquid going over it is recorded by means of ball-float and chart. The quantity being pumped is controlled by a throttling discharge valve which is normally opened up 3¼ inches on the spindle of a 10-inch valve. A sample is continuously obtained by a revolving unit in the form of a piece of pipe which operates at about 10 r.p.m. and discharges the sample into a tank 3 feet 6 inches in diameter and 3 feet 6 inches deep. The consistency is tested five times a day and an accurate composite sample is obtained by stirring up the stock in the sample tank. The quantity of pulp that is pumped is computed from the consistency of the samples together with the volume of liquid passing over the weir. All the stock goes through Sherbrooke (Impco) screens having ¼ inch round holes before entering the pump.

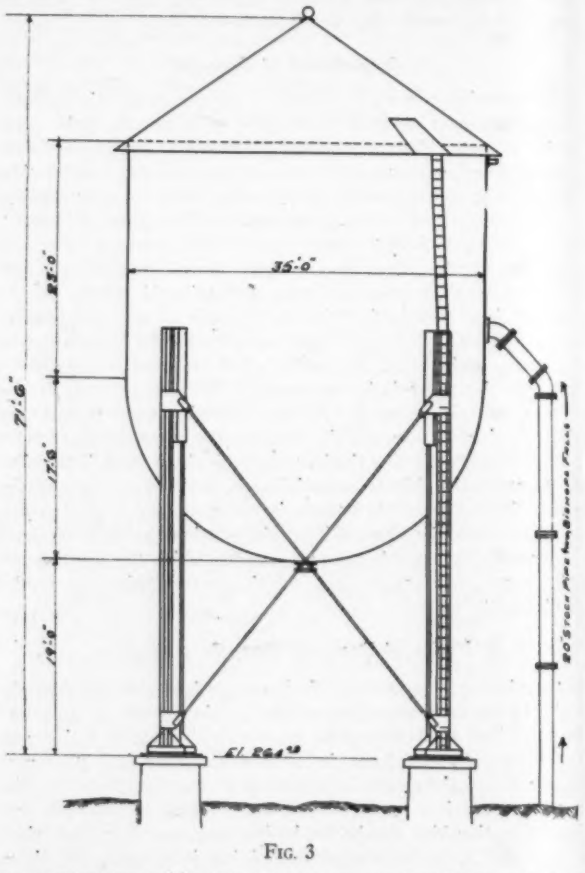


FIG. 3
Ground Wood Stock Tank (The A. N. D. Co., Ltd.) at Grand Falls, N. F.

Pumping Equipment and Pipe Line

The pumping equipment (Fig. 2.) consists of two Cameron No. 10 double suction, type D. V. pumps designed to handle 1550

g p.m. of ¾ of 1 per cent groundwood stock against a 252 ft. total head. Each pump is connected to a 200 ft. squirrel cage motor running at 450 r.p.m. There is a separate motor for each pump and only one pump is used at a time although they may be operated in series, and the installation has a maximum pumping capacity of 3,399,904 gallons of 0.75 per cent stock per 24 hours or 135 tons of groundwood pulp per day.

The eleven mile stock line is made of 5/16-in. wrought steel, lead jointed, 20-inch diameter pipe and it is underground except at a few points. These places are insulated and no difficulty has been experienced with freezing, although as a measure of precaution liquid is kept moving through the pipe line continuously during the winter. The pressure on the line varies from 95 to 105 pounds according to the quality of stock pumped, although the pump casing pressure is designed to withstand 250 pounds working pressure. The hydrostatic pressure is 63 pounds as this is the pressure recorded by the gage at Bishop's Falls when the valve at the base of the tank at Grand Falls is open. The friction load in eleven miles of pipe line and the power required to lift the stock to a height of 140 feet is therefore about 40 pounds. When the stock reaches Grand Falls it goes into a groundwood storage tank (Fig. 3.) and from there is goes through the regular screening process where it is mixed with the groundwood pulp made at Grand Falls.

Consistency and Operating Records

Although no attempt is made to hold the stock at Bishop's Falls at a predetermined consistency, it is desirable to keep it below 1 per cent since the friction load increases very rapidly above that figure and results in the marked reduction in the capacity of the pumps. The best record of pumping stock yet obtained was on October 6, 1926, when 93 tons of stock was pumped at an average consistency of 1.109 per cent in a period of 24 hours. November 12 might be considered an average day's operation when 1,860,780 gallons of stock or about 1,300 gallons per minute were pumped. This is at the rate of 76 tons per day and the consistency for the day averaged 0.825 per cent.

While it is possible at full operation to pump the stock from Bishop's Falls to Grand Falls in 9 hours, the average time is between 10½ to 15 hours. The pipe line is cleaned out every Saturday night and no difficulty has been experienced in regard to cleanliness of stock or other similar troubles.

Power Cost

Although no figures of power cost are available the economy of using the pumping method of transporting stock is obvious when compared to the cost of lapping, storing, loading on cars and the subsequent unloading and repulping of the stock. Assuming a power rate of $25 per hp. per year, which approximates the reported base rate of Shawinigan Falls power, it would cost approximately 10 cents per ton for the power required to transport the pulp from Bishop's Falls to Grand Falls, a distance of eleven miles up a height of 140 feet.

The major part of the information regarding this installation and also for the cuts and illustrations was made available through the courtesy of Mr. Vincent Jones, one of the directors of the Anglo Newfoundland Development Company, Ltd., a corporate member of the Technical Association.

2. Pumping Unbleached Sulphite About Four Miles

By Stanton W. Mead *

Consolidated Water Power and Paper Company has one of its paper mills with a groundwood plant at Biron, Wis., about four miles from Wisconsin Rapids, where its largest mill is located, which has a sulphite mill in connection as well as a groundwood mill.

At Biron about 140 tons of news and hanging paper is made per day requiring approximately 35 tons of sulphite per day. The sulphite was formerly lapped at Wisconsin Rapids and transferred by rail to Biron. In the interests of economy a pipe line 20,800 feet long was laid during 1926 between the two plants, the difference in level being 60 feet.

Present Operation

At Wisconsin Rapids mill the screened sulphite as it comes from the thickeners is mixed with white water to a consistency of about 1 per cent in the head box supplying the pump. There is no arrangement whereby the density is controlled but a reasonable uniformity is maintained. At the Biron mill the pulp is run over thickeners to a consistency of about 3 per cent to supply the beaters or mixing system.

Pumping Equipment and Pipe Line

The pumping equipment consists of a 5 inch centrifugal pump operated by a 60 horse power motor.

The 20,800 feet (3.98 miles) of pipe is of cast iron equal to *C* piping, 10 inches in diameter, laid underground except where crossing the Wisconsin River in Wisconsin Rapids, where it follows the railroad bridge.

The discharge end of the pipe at Biron is about 60 feet above the intake and while pumping the pressure at the pump varies from 60 to 75 pounds.

Operation

The pipe line was completed about the middle of July and operated very satisfactorily until about the middle of December, when trouble was experienced from slime. This is a difficulty, which although not serious, we are endeavoring to remedy either by means to prevent its formation or by pumping heavier stock to keep the pipe cleared.

* General Manager Consolidated Water Power and Paper Co., Wisconsin Rapids, Wis.

3. Pumping Bleached Sulphite From Canada to United States

By G. P. Genberg *

The arrangement for delivering slushed stock from Edmundston sulphite mill to Madawaska paper mill consists of three parts:

1. Pumping station at the delivery end in the pulp mill.
2. A pipe line connecting the two mills.
3. Measuring and dewatering plants at the receiving end.

The stock is taken from the thickener flow boxes and is dewatered to about 1½ per cent on a Woods thickener. The stock is then diluted with water and the consistency finally adjusted, if necessary, by the introduction of 2 per cent stock from the machine chest. The addition of water and thick stock is regulated by a Trimbey stock regulator, which regulates the stock to approximately 0.80 per cent consistency.

For pumping the stock an 8-inch Gould double suction pump is used, running 1,200 revolutions per minute, with a capacity of 2,000 gallons per minute. The diameter of the impeller is 14 inches. The pump is driven by a 75 horsepower direct connected motor. This motor is, however, too large for the work required. The amount of stock pumped during 24 hours is 75 tons at an average consistency of 0.80 per cent with an average power consumption of 45 horsepower.

The pipe line, which is 5,200 feet long, has an inside diameter of 17 inches. It is built out of tongue and grooved wooden staves

* Member TAPPI. Chief Chemist Fraser Companies, Ltd., Edmundston, N. B.

cut from lumber 4 x 4 inches, which has been planed down to 3¼ x 2⅝ inches. The total net volume of the pipe in its full length is 63,000 gallons. Immediately beyond the pump, the pipe line goes under ground the entire distance, except 925 feet, which is exposed, where the pipe line goes over St. John River. For this distance, the pipe is attached to the International bridge.

The static head on the pump is 37 feet, which together with the increase due to friction head gives a total of 35 pounds per square inch average back pressure on the pump.

The flow of the stock is regulated from the receiving end and when more than 75 tons per 24 hours is taken this back pressure may drop as low as 24 pounds per square inch. When less amount of stock is taken the pressure may go up at times to 39 pounds per square inch.

In the basement of the paper mill the pipe line is divided in two parts, each 12 inches inside diameter, going to separate paper machine lines. The receiving end consists of a flow box equipped with V-notch weirs, and a Cochrane meter, one for each paper machine. An automatic sample device collects a sample of the slush stock going to each machine for every half minute. The sample is dumped in a container, from which an average composite sample is taken for every 24 hours to determine the average consistency. From the flow boxes the stock is dewatered, and the thickened stock goes to the beater stock chest. The water amounting to about 2,000,000 gallons per 24 hours is settled in Dorr tanks for the recovery of fiber.

The charges for slushing the stock is simply power, overhead and what little lubricants are required by the pump at the delivery end. The total cost, including these three items, is not exceeding 25 cents per air dry ton.

In view of the fact that part of the pipe line is not underground, the temperature was watched very carefully during the first winter after the installment of the pipe line. The stock travels relatively slowly, only about 85 feet per minute, and very severe weather may occur during the winter months. However, freezing did not occur and any danger on this point seems to be rather remote, judging from the temperature readings during the winter.

TEMPERATURE READINGS

Date	Delivery end pulp mill Degrees F.	Receiving end paper mill Degrees F.
December 15, 1925	35.6	37.4
January 5, 1926	35.8	37.4
January 18	34.7	35.6
February	36.5	35.6
March 1	36.0	35.6
March 15	35.6	35.6
April 2	34.9	35.6
April 30	35.6	35.6
May 1	35.6	35.6
May 15	41.0	41.0

Another factor to consider in the connection with the danger of freezing is the fact that the stock is under a pressure varying from 15 to 40 pounds per square inch, which in itself decreases the freezing point of water to some extent.

At the time of shut downs a stream of water is pumped through the pipe line. Any trouble from dirt or slime has not been experienced during the fifteen months this installation has been in operation.

Report of Committee on Sulphate Pulp

By R. H. Stevens, Chairman

The work of this committee has necessarily been subject to the usual limitations of such work when the members are widely scattered and dependent upon correspondence for interchange of ideas. In the beginning the chairman requested each of the others to suggest such items as he thought should be included in this year's program. From these suggestions the following were selected:

1) Question: "What constitutes good salt cake? What is the special detriment of each of the impurities commonly found and what should be the limits allowed for each?"

2) Question: "What is the best method of washing sulphate pulp? What are the losses of chemicals in the usual methods of washing?"

3) Question: "What are the usual losses of alkali in the recovery room? Where do these losses occur?"

4) Question: "What is a suitable standard of quality for sulphate pulp? What tests should be used for it?"

In attempting to study these questions the committee decided to adopt Mr. Baker's suggestion of last year and send out questionnaires under the Service to Members plan. The first two items have been treated in this way and the results analyzed. A questionnaire covering the third has been prepared, but not yet sent out. The fourth item has not yet been attacked in dead earnest.

Still another matter was suggested at the convention last spring, viz., the odor nuisance and possible means for its abatement. This is too large a subject to be solved in one year, but it has received some consideration.

Quality of Salt Cake

The matter of salt cake quality appeared to interest the TAPPI members and a good set of replies was received. The weight of opinion appeared to be that good salt cake should contain at least 95 per cent Na_2SO_4. It is poor economy to use low grade salt cake regardless of the price. For as the Na_2SO_4 content falls below 95 per cent the reduction is disproportionately lowered and the entire system becomes clogged with impurities. It might even prove profitable sometimes to pay a premium for extra pure salt cake. For example if a mill is paying $20 a ton for 95 per cent salt cake and consuming 400 pounds per ton of pulp and could reduce its consumption to 380 pounds by using 96 per cent salt cake then if the latter costs anything less than $21 a ton it would prove cheaper than the former.

SODIUM CHROMATE.—Opinion was divided as to the objectionableness of the various impurities. Sodium chromate seemed most decidedly taboo, the vote standing 5 to 1 for total exclusion in so far as possible. The objections were based on its effect in raising the melting point of the smelt and consequent deterioration of the smelter. One reply stated, "Yellow cake always contains 5 to 10 per cent of moisture while white cake seldom exceeds 1 per cent." Another thought the reduced chromate forms a gelatinous precipitate in the green liquor which slows up the settling of the sludge. Only one was willing to say a good word for chromate and the best he could say was, "not harmful if under 0.5 per cent."

MAGNESIA.—Next to chromates the largest number turned "thumbs down" on magnesia because it forms a slimy hydroxide that hinders the settling and washing of the sludge. Another objection was that it causes deposits in the furnace. Magnesia was not entirely ostracized, however, as one man declared its sulphate would be reduced to the sulphide and the latter would react like Na_2S in the digester. The average amount deemed permissible when allowed at all was 0.5 per cent.

IRON—After magnesia iron proved the most widely objectionable. The maximum thought tolerable was 0.6 per cent, but with alumina and lime included. The average of the limits proposed was 0.38 per cent. The grounds for objection, aside from taking the place of the desired Na_2SO_4, were: "May give trouble in the dissolving tanks by giving false Baumé reading"; "forms gelatinous precipitate which interferes with the settling of the sludge"; "colors the pulp due to formation of double sulphide with sodium"; "may cause deposits in the furnace."

INSOLUBLE MATTER.—Insoluble matter was objected to by a bare majority, the extreme limit suggested being 3.0 per cent with as little as one-tenth as much objected to by one individual. The

average of the limits suggested was 1.1 per cent. The main objections raised against this impurity, which was considered as mainly silica, were: retarded settling of lime sludge; formation of deposits in furnace; formation of inert sodium silicate; increased loss of Na_2O in sludge on account of adsorption by colloidal SiO_2, or possibly formation of insoluble double silicate of sodium and calcium.

FREE ACID.—Opinion was equally divided as to the undesirability of free acid, salt and lime. Several were of the opinion that a certain amount of free acid might prove beneficial, particularly if an equivalent amount of salt were also present. The idea seemed to be that in buying on a guaranteed Na_2SO_4 content the free acid and salt would be deducted in computing the analysis and yet would react in the smelter to form additional Na_2SO_4, which would thus be obtained without cost. Objections to free acid were chiefly based on the liberation of H_2S by interaction with sulphides in the black ash, or of HCl by interaction with chlorides. Both these gases exert a powerful corrosive action on iron equipment, besides being a menace to the health of the operatives. The maximum limit suggested was 2.5 per cent; the minimum 1.0 per cent; average, 1.63 per cent, calculated as H_2SO_4.

SALT.—Salt was objected to on account of its corrosive action, or that of the HCl liberated from it if enough free acid were present. Also because of its inertness in cooking. It was also said to cause trouble in washing pulp by "salting out" soaps, etc. The limits suggested ranged from 0.75 to 3.0 per cent with 1.44 per cent as the average.

LIME.—Lime was found objectionable mainly because of its supposed action on furnace linings and evaporator tubes. Mainly, however, it was deemed inert and to be shunned on that account rather than because of any positive detriment. The limits were almost unanimous at 1 per cent as $CaSO_4$. One was willing to allow 2.25 per cent provided other impurities were low.

MOISTURE.—The only other impurity suggested as worth special mention was moisture. This besides replacing the desired sodium sulphate causes caking of the product, thereby making it more difficult to mix with the black ash. The limits suggested ranged around 2 per cent with one as high as 2.5 per cent, and another as low as 0.5 per cent. One declared: "A small moisture content is desirable," but did not explain whether he meant the salt cake should not be anhydrous or that whatever the moisture content might be it should be small.

FINENESS.—The degree of fineness aroused considerable discussion. Most agreed that too fine grinding means loss in handling and by volatilization or by carrying away with the draft. On the other hand coarse lumpy calt cake does not mix well with the ash. "The size of a small pea" was the favorite answer, which probably means a particle with diameter from 4 to 6 millimeters, or about 1/5 to 1/4 inch. Where salt cake is dissolved in the black liquor, however, it was thought an advantage to have it pulverized as finely as possible. One contributor stated the finely ground salt cake is the purest and substantiated his statement by giving analyses of two samples differing by passing through 20 mesh screen, or being retained by it. The finer contained 91.79 per cent Na_2SO_4 while the coarser had only 86.45 per cent. Another participant differentiated between two classes of salt cake, saying, "that from hand fired furnaces can be bigger in size and no trouble will be experienced. Salt cake from mechanical furnaces is harder to melt, owing to the nature of manufacture."

After due consideration of the above the committee suggests, tentatively, that the following be considered a suitable definition of salt cake satisfactory for use in the manufacture of sulphate pulp:

Analysis	%
Moisture	0.5 to 1.0
Free Acid (H_2SO_4)	1.0 to 2.0
Salt (NaCl)	1.0 to 2.5
Iron (Fe_2O_3)	0.2 to 0.4
Lime ($CaSO_4$)	0.5 to 1.0
Magnesia ($MgSO_4$)	0.0 to 0.5
Chromate (Na_2CrO_4)	0.0 to 0.5
Sodium Sulphate at least	95%

The lower limits are suggested, not as being an amount that is beneficial, but rather to show what can be expected in a real good salt cake.

Where the salt cake is to be mixed with the black ash and fired into the furnace it is suggested that 60 per cent should pass through a screen having ¼-inch openings.

Effects of Impurities Should Be Studied

The committee suggests further that the members of the Association who are engaged in the manufacture of sulphate pulp be invited to consider carefully the effect of each of the impurities mentioned when present in excessive amounts and to report to the committee the results of any observations along this line. Also that such members be invited to observe the effect of particle size on the recovery operation and to communicate these and other observations which might prove of value to the committee to the secretary of the Association for the use of the committee in further study of this subject.

Washing Sulphate Pulp

The matter of washing sulphate pulp attracted even more attention than quality of salt cake. Three methods of washing are in vogue: one, the old open pan system, two, the more usual diffusion process, and three, the newer suction filter method. The data collected by the committee make possible a very interesting comparison of these different types of equipment as well as of the varying degrees of efficiency obtained in different mills using the same process.

SUCTION FILTERS.—Three-fourths of the replies dealt with diffuser washing. Only one-tenth were using the open pans and only four replies dealt with suction filters. Of these four one reported only what he had seen or heard without giving any detailed information. Another told of experience or observation in several mills. While his replies were in the main definite and valuable it was thought best to consider only the remaining two bona fide operating reports. These two showed considerable difference in operating efficiency. Thus:

	A	B
Size of filter	6 ft. wide x 6 ft. diam.	10 ft. wide x 6 ft. diam.
Pulp washed per sq. ft. per min., pounds	0.294	0.184
Consistency of pulp to filter, %	2½ to 3	1½
Thickness of cake on filter, in.	1 to 1¾	1½
Vacuum, inches	8 to 12	4 to 16
Consistency of pulp sheet, %	20	22
Speed of filter, r.p.m.	0.63	1
Wash water: Gal. per min.	91	60
Gals. per sq. ft.	0.587	0.215
Gals. per ton of pulp	525	2000
Dilution: Water per lb. pulp, lb.	2.14	5.84
Bé of liquor from digesters	16°	18½°
Bé of liquor to evaporators	12°	11½°
Alkali left in pulp (salt cake per ton), lb.	73	80

CONCLUSIONS.—Judging by these two cases only it would appear that greater efficiency is obtained by feeding pulp at high consistency, operating at low peripheral speed and using a rapid flow of wash water. Both were using hot water (150 degrees F.) and both reported no weak liquor going to sewer. Both were using fir wood, with some hemlock in the case of A, and some tamarack in B's case. The latter said his wood was "slightly resinous," which fact undoubtedly has considerable bearing on the ease of washing. It is well known that while sulphate pulp from non-resinous woods can be washed readily enough on suction filters that from very resinous woods, such as southern pine, has never yet, to the writer's knowledge, been washed successfully on this type of equipment. The soap formed from the resins causes excessive foaming. The latter either breaks the vacuum or else causes terrific loss of alkali through foaming through the equipment into the sewer.

OPEN PAN.—All of those using open pan washing were operating on pine. They reported from 300 to 4,875 gallons of wash water per ton of pulp. Presumably the "300" is a typographical error. It would seem more reasonable to expect 3,000 gallons since the dilution of black liquor is from 18 degrees down to 10½ degrees Baumé. This mill admitted losing 0.5 per cent of soda

run direct to the sewer as black liquor. If this means Na_2O then the amount of alkali "ditched" amounted to 300 pounds of salt cake per ton of pulp. The washed pulp was found to contain 0.2 per cent of alkali, or 10 pounds of salt cake per ton.

DIFFUSER.—Where diffusers are employed it appears customary for these to have a capacity of 10 to 15 per cent greater than the digesters. The sizes ranged from 1,319 cubic feet to 2,712; average 1,817 or around 3½ tons of pulp. The washing time varied around 9 hours, being variously reported, e.g., "6 to 8 hours" or "8 to 12 hours." Two-thirds of the mills were using a depth of stock in the diffuser of 15 feet or more. Three used as much as 18 feet; only two as little as 10 feet. Relatively low water pressures appeared to be the rule. Only four were using more than 25 pounds water pressure at the top while an equal number used less than 20 pounds. The lowest pressure reported was 12 pounds; highest 65 pounds. Unfortunately the question whether or not two or more diffusers were being washed in series was not included in the inquiry. The height to which the liquor is discharged was asked for, however, and a bare majority said the discharge was above the top of the diffuser. Obviously only these could use series washing. The one using the highest water pressure discharged the liquor above the top of the diffuser, but allowed it to go to a tank before being pumped to another diffuser.

Estimation of the Soda Remaining in the Pulp

The advantage gained by increasing the water pressure appeared to be shorter washing time. There seemed to be no direct relationship between pressure and amount of alkali left in the pulp. On the contrary the mill using the greatest water pressure made the poorest showing in this regard. This is explainable, however, on the ground of more accurate determination. This brings up the question how the amount of alkali left in the washed pulp should be estimated. Obviously any method which omits incineration of the fiber and examination of the ash is inadequate. Yet most of the mills are contenting themselves with a simple titration of a water extract of the sample, or even of the water squeezed out of the sample, and on finding only 2 or 3 pounds Na_2O per ton of pulp are "kidding themselves" about the efficiency of their washing methods. This is no less true of those using open wash pans and suction filters and renders useless any attempt to compare these methods in this particular. The committee feels that this matter of accurate determination of the amount of alkali left in the pulp might very properly be included in next year's program. To this end it is suggested that all members of the Association actively engaged in the manufacture of sulphate pulp be invited to study this point and communicate their suggestions to the Secretary for the use of the committee.

Waste of Weak Liquor to Sewer

Another important source of loss of alkali in pulp washing is the weak liquor allowed to run to the sewer. Only two of the replies made any attempt to deal with this part of the inquiry and both stated no weak liquor was allowed to go to the sewer. The same reply was made by those using suction filters. Unfortunately the committee failed to include losses from the wet room in its questionnaire. It often happens that "pockets" of unwashed, or insufficiently washed pulp occur inside a diffuser and on dumping this pulp is mixed with the rest and in its passage over the screens and wet machines or pulp thickeners is more or less completely freed from this alkali. The wet room effluent is so voluminous, however, that it is no easy task to measure and sample it, or to determine accurately the amount of alkali in a proper sample. In one instance where an accurate check was made of the amount of alkali in the black liquor coming from the diffusers over a period of one week it was found that 89.2 per cent of of the alkali charged into the digesters was recovered at this point. The total recovery in the complete cycle, i. e. back to the digesters again was 78.6 per cent. Thus one half the entire loss of alkali occurred during the cooking, blowing and washing of the pulp. This is probably a fairly representative case.

Fiber Losses

The question of fiber loss was raised only in regard to that going to the evaporators. The answers ranged from an indefinite "little" to as high as 50 pounds per ton of pulp washed. The majority of the mills do not screen their black liquor. This is true for all classes of washing equipment.

Dilution of the Black Liquor

The amount of dilution of the black liquor appears to be less when the diffusion washing is practiced than with either of the other methods. The average for the diffusers is from 13.2° down to 10.25° Bé., for the open pans from 15° to 8.5° Bé the former being the density of the liquor coming from the digesters in each case. The comparison with the suction filters is hardly fair in view of the fact that only two replies including this point were received. Expressed as pounds of water added to the black liquor per pound of pulp washed the record is as follows:

	Maximum	Minimum	Average
Suction filters (2 only)	5.8	2.2	4.0
Diffusers	13	1.5	3.4
Open pans	14	9¼	11.6

The amount of wash water reported used per ton of pulp was:

	Maximum gal.	Minimum gal.	Average gal.
Suction filters	2,000	525	1,262
Diffusers	5,000	880	2,927
Open pans	4,875	3,000	3,437

Use of Hot Water

Hot water is commonly employed, the average temperature being 136°F. Only two mills used cold water. One of these was equipped with diffusers; the other with open pans. The water is usually heated indirectly by being used in a condenser either on the digester blow line (or relief line), vacuum evaporators, turbine exhaust, etc., or in cooling the air nozzles in the smelters. In only one instance was condensate from any of the multiple effects after the first employed for washing pulp. In this instance the reply failed to indicate whether or not any odor was observed in the washed pulp which might be attributed to the evaporator condensate.

Comparison As to Space, Power and Labor

An interesting comparison has been established as to building space, power and men per shift required by the different methods. Thus for 100 tons per 24 hours:

		Diffusers	Filters	Open pans (Only one reply considered)
Building space, sq. ft.	Maximum	5,236	2,400	3,600
	Minimum	2,100	1,500	
	Average	3,700	1,850	
Power, h.p.	Maximum	200	160	100
	Minimum	40	100	
	Average	87	130	
Men per shift,	Maximum	4	1	3
	Minimum	2	1	
	Average	3	1	

Apparently the suction filters require less building space and fewer men per shift, but the diffusers are more economical of power.

Wood Species

The following wood species are represented: pine, jack pine, spruce, hemlock, balsam, fir and tamarack. It does not appear that the tree species has any influence on the other points except possibly on the amount of wash water required. The mills using fir report the lowest number of gallons per ton of pulp and those using pine the highest. Whether this is due to differences in some characteristic of the pulp, such as freeness, or to purely local conditions the committee is not in a position to determine.

Recovery Room Losses

The third item in the committee's program, viz. recovery room losses, has been covered in a questionnaire which is now ready and will be mailed out shortly. All members of the Association having to do with the manufacture of sulphate pulp are urged to participate in it.

Thus three items of our program deal with the purity and conservation of the chemicals used in the process of manufacture. The fourth item deals with the product and its standardization.

We are all accustomed to judge pulp quality in some way or other. We speak of "hard" pulp and "soft" pulp, but these terms have no quantitative meaning. How hard can a "soft" pulp be without being a "hard" pulp? How much contention, even litigation, might be avoided if we had some standard by which to measure the quality of sulphate pulp! We have our beating tests, of course, and they are valuable as a guide, for control work, but only so far as possible to duplicate a given set of conditions. Generally speaking no two operators using similar, but not identical, equipment can obtain the same result in testing the same pulp.

Readily Applicable Test Needed

We need some readily applicable test that will yield reliable and comparable results suitable not only for mill control work, but for referee purposes as well. The committee feels, however, that this is too big a task for any committee of three or four members each of whom is already heavily burdened with his daily job in the mill. Rather it is a problem which might challenge the attention of some group of scientists working in a public or quasi-public, institution, who can devote to it the time and energy which its importance and its difficulty demand and who have at their disposal the facilities needed for such an undertaking.

Sulphate Mill Odors

At our meeting one year ago the matter of odor nuisance and its abatement was suggested for our consideration. In this direction the committee has made no direct progress. Last summer a patent[1] was issued covering the use of phosphoric acid or phosphates, added to the digester, for the purpose of preventing the formation of methyl mercaptan or other organic sulphur compounds responsible for the odor nuisance. The writer made one experimental cook using 10 pounds of wood and disodium phosphate equal to 0.5 per cent of the wood as Na_2PO_4. All trace of disagreeable odor disappeared. It remains to be seen however, whether or not it would return in the recovery operation. There is also the matter of cost to consider. For if the cost were as little as fifty cents a ton of pulp any mill using the process would be handicapped in that extent in competing with mills not using it. Unless all would do so none could afford to.

It has been reported that the Nordstrom drying tower has accomplished remarkable results in absorbing the malodorous gases at the Crown-Willamette Paper Company's mill in Camas, Wash. The committee has not investigated this directly, however. The use of the drying tower would probably render it impossible to recover byproduct turpentine from the digesters.

In some of the mills the steam and gases expelled when a cook is blown are condensed. For example the Central Paper Company, at Muskegon, Mich., are blowing the exhaust from the diffusers through a separator and spray condenser into a sewer discharging into the lake. Spraying seven hundred fifty gallons of water per minute through nozzles similar to inverted sprinkler heads eliminates the odor to a great extent.

The Odor Nuisance and Health

Serious as the odor nuisance is, particularly to those mills located in or near populous cities or towns, its importance is overshadowed by the belief existing in some quarters that the malodorous gases are detrimental to public health. It has been reported that in one community there had been an alarming increase in pulmonary diseases, especially tuberculosis, since the establishment of a sulphate mill there. The rumor even quoted a prominent physician and a public health officer as authorities for the statement that the odor from the pulp mill was directly responsible for the situation. Investigation disclosed the rumor was entirely without foundation. Neither of the persons quoted had ever made any statement of that nature and the public health records showed that pulmonary diseases, and especially tuberculosis, were actually less prevalent in the pulp mill town than in any other place of its size in the state. Believing this should be followed up further the committee prepared a circular letter of inquiry which was sent to every sulphate pulp mill in United States and Canada. Replies were received from nearly every mill in North America. They were unanimous in declaring that any idea that the odors of the sulphate pulp mill are injurious to public health is absolutely without foundation. Several cited public health records to prove that pulmonary diseases, and especially tuberculosis, were actually less prevalent in their community than in other localities similarly situated where there was no pulp mill. One company enclosed a statement from the public health officer who declares health conditions had improved considerably since the pulp mill was established, probably because of better living conditions that followed the steadier employment of the pulp mill workers.

[1] U. S. Pat. No. 1,597,841 to B. S. Summers, "Art of Making Paper Pulp."

Report of Mechanical Pulp Committee

By C. K. Andrews, Chairman

During the past year the Mechanical Pulp Committee has confined its efforts principally to carrying on work already started. Information has been gathered from various mills covering different types of grinders as outlined in the proposed code for comparison of grinders last year, and a paper is being prepared on the material collected. The practicability of the proposed code can be judged by this paper, and if it proved practical, it can be adopted by the Association as a standard for grinder comparison.

Study has been made of the freeness tester adopted by the Canadian Technical Section; also other types of freeness testing equipment in use, and a paper covering the investigation will be presented.

Recovery of Screenings

It is encouraging to note the increased interest most mills are taking in the recovery of groundwood tailings. The Committee has continued its study of groundwood screenings refiners and prepared a short paper covering the progress made in the different mills the past year.

A better method of controlling the quality of groundwood from the individual grinders is desirable and a paper has been prepared on the power-freeness relation. This paper offers suggestions for controlling the uniformity of the stock from the individual grinders.

Artificial Pulpstones

No study of artificial stones for grinding pulp has been made by the Committee. The Norton Company of Worcester, Mass. who has been experimenting on artificial pulpstones for some years, is now offering a stone which they guarantee against breakage. This was described before the Association in 1925 by W. W. Grenwood and published in Technical Association Papers, Series VIII.

The stones can be made of any grit desired, uniform grit throughout, built to require very little sharpening, and require no seasoning. The first cost is high, but the cost per ton on stones in service up to 523 days compares favorably with quarried stones. The artificial stone has many advantages over quarried stones, and I believe it would be well to give some attention to this subject the coming year.

Water Resistance of Mineral Coated Papers

By George K. Hamill[1]

I. Introduction

At the February, 1926 convention of the Technical Association of the Pulp and Paper Industry, the recent work of the Bureau of Standards on coated papers was summarized in a progress report.[2] In the discussion of this paper the subject of the water resistance of coated papers in general and of glue-bound papers in particular, received passing attention. There seemed to be substantial agreement in the opinions expressed that in coated papers for printing processes other than lithography, water resistance is ordinarily required only so far as to prevent damage to the coated surfaces by any possible atmospheric conditions. There is considerable uncertainty as to the degree of water resistance needed for lithographing but it is necessary that glazed papers, especially those colored with aniline dyes, be sufficiently water resistant to prevent smudging or discoloration in the pasting or gumming, folding, and "smoothing on" operations of fancy box manufacturing.

In judging the quality of coated papers two empirical tests are generally used. In one, the moistened thumb is pressed heavily on the coated surface and withdrawn quickly,—a paper from which no coating is removed by this means is usually preferred to one from which a portion of the coating is removed by the thumb. The second test known as the sealing-wax pick test[3] is used for comparing the respective tendencies of coated papers to "pick" or lift during printing operations. Both of these methods primarily test the cohesion of the coating and the adhesion of the coating to the body paper. The results of such tests are therefore largely influenced by the amount and quality of the adhesive present although in addition, the moistened-thumb test may be influenced somewhat by the water resistance of the coating. These tests are of value in comparing coated papers in cases where complete information is available regarding the prospective use of the papers. But even for printing purposes, failure of coated papers to meet these tests satisfactorily does not necessarily bar them from use. For instance, it is not unusual to find in high-class publications where no color-printing is used, that is, in reproductions in black ink only, that in order to secure beautiful contrasts and a soft-feeling finished sheet the publisher has chosen such a "soft-sized" paper that a portion of the coating may be removed by the moistened thumb. Similarly, variations in humidity, inks, printing processes and conditions, render it difficult to judge accurately from sealing-wax pick tests what may be expected of different coated papers when used in the graphic arts[4]. Possible improvements or modifications of the tests for the resistance to picking or lifting of coated papers are being studied by several investigators in cooperation with the TAPPI Paper Testing Committee.

During the past year the price of casein has been sufficiently high to interest many coated paper manufacturers in the development of alternative adhesives for their processes. The use of such materials frequently raises the question of the water resistance of papers so coated, and this in turn involves the testing of coated papers for water resistance. Since by far the largest proportion of the coated paper manufactured in this country is used in printing processes in which the question of water resistance is not involved, the need and value of methods for testing the water resistance are not considered as important as methods for testing the rate of absorption of organic solvents such as are used in the manufacture of printing ink. However, since the question of water resistance persists, and since glue is an effective sizing agent against both aqueous and organic solutions, consideration has been given tests involving the use of water. Brief mention was made at the 1926 meeting of the possibility of applying the tests ordinarily used for determining the degree of sizing of uncoated papers to obtain measurements of the water resistance of coated papers.

Since there has been considerable interest in these matters shown by coated paper manufacturers and users, the Bureau of Standards in cooperation with the Glue Research Corporation has, as time from other investigations permitted, continued its study of the use of glue in coated papers, chiefly seeking to improve the water resistance of such glue-bound coated papers. This work has required consideration of methods of testing coated papers for water resistance and the relation of such tests to other tests commonly applied to these papers. In addition studies have been made of the improvement in the water resistance of glue-bound coated paper by applications of formaldehyde and of the effects of formaldehyde on the viscosity and working life of glue-containing coating mixtures.

II. Testing Coated Papers for Water Resistance

1. Description of Methods

In attempting to define numerical values for the water resistance of coated papers, two sizing tests developed at the Paper Section, the indicator[5] and the curl[6] methods were used. In the indicator method a small quantity of water-soluble dyestuff diluted with at least fifty times its weight of dry, powdered, sugar, is sifted onto the surface of the test piece. This test piece is then floated on a water surface and the time required for the water to pass through the paper is measured, the development of the dye color serving as an indicator for the transudation of the water. In the curl method a mechanical appliance is provided to hold the test piece in such manner that a strip in the machine direction of the paper is in contact with a water surface, leaving the unfixed end of the test piece free to curl as the wetted portion is penetrated by the water. The time interval is measured from the instant the sample comes in contact with the water to that at which the test piece starts to uncurl. A stop watch is used for timing in both of these tests and the results are expressed in seconds and fractions thereof.

Comparative tests were made by these two methods on a large number of hand-coated sheets prepared in the laboratory, on several papers coated on the semicommercial machine of the Bureau experimental paper mill and on numerous samples of commercial coated papers. The tests were generally made so that an equal number of results were obtained from the two sides of the paper whether the sample was coated on one side or both sides.

In addition to studying the applicability of size-testing methods for determining the water resistance of coated papers, a number of experiments were made with the Bureau's wet-rub tester. By this device, which has been developed recently for the testing of tub-sized and processed papers, the resistance of paper to abrasion while wet is measured by passing a weighted rubber eraser back and forth over the wetted surface of the test strip

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[1] Member TAPPI. Research associate of the Glue Research Corporation at the Bureau of Standards.

[2] Hamill, G. K., Considerations of glue-bound coated paper: Paper Trade J., 82, No. 8, pp. 123-6, Feb. 25, 1926. Technical Association Papers IX (1926), No. 1, p. 77.

[3] Manufacture of Pulp and Paper, Vol. 5. The manufacture of coated paper, pp. 38-39 of section on coated paper. McGraw-Hill Book Co. (Inc.), 1925.

[4] Use of glue in coated paper: Bureau of Standards Technologic Paper, No. 323, p. 656. Government Printing Office, 1926.

[5] Carson, F. T., Testing paper for permeability to liquids: Paper Trade J., 80. No. 10, pp. 59-62, March 5, 1925. Technical Association Papers VIII (1925), p. 91.

[6] Carson, F. T., A new sizing tester for paper: Paper Trade J., 79, No. 17, pp. 44-45, Oct. 25, 1924.

until the sample is worn completely through. In using this testing device on coated paper the number of double rubs required to wear through the top coating was noted as well as the double rubs required to wear completely through the sample. Tests were made with the test surfaces distinctly wet as in testing other papers and also with the surfaces only moistened.

Several samples of commercial colored coated papers were compared by the indicator sizing test with the coated surfaces in contact with the water, by the moistened-thumb test, by rubbing with a wet cloth to test for "smudging" and by the sealing-wax pick test, to ascertain whether or not any fixed relationships exist between the test results obtained by these different methods.

2. TABULATION AND DISCUSSION OF RESULTS.

The results of the tests for water resistance of a considerable number of hand-brushed laboratory samples, semicommercial machine-coated papers, and commercial coated papers are assembled in Table 1. These test results are generally representative of the work outlined in the previous sections, and unless otherwise noted were obtained by one observer.

(a) *Indicator Method.*

In testing the first series of hand-coated papers by the indicator method, a comparison was made between the use in one test of three colored materials applied in parallel lines to the test piece and the use of a single indicator thinly scattered on the

TABLE 1

COMPARISON OF TESTS OF COATED PAPERS FOR WATER RESISTANCE BY THE INDICATOR AND CURL METHODS AND OF TESTS FOR RESISTANCE TO WET RUBBING

Lot number.	Weight, 500 sheets 25 by 38 inches	Weight, coating	Ratio, weight coating to weight body stock	Concentration of spraying solution, as 100% formaldehyde	Proportion of 100% formaldehyde, based on weight of glue added to coating mixture.	Sizing tests: Indicator method: Coat down: Tri-color	Sizing tests: Indicator method: Coat down: Pontacyl acid scarlet	Sizing tests: Indicator method: Coat up: Pontacyl acid scarlet	Sizing tests: Curl method: Coat Down	Sizing tests: Curl method: Coat Up	Wet-rub tests: Wet in usual way: Coating only	Wet-rub tests: Wet in usual way: Rubbed completely through	Wet-rub tests: Moistened only: Coating only	Wet-rub tests: Moistened only: Rubbed completely through
	lb.	lb.	%	%	%	sec.	sec.	sec.	sec.	sec.	Double rubs	Dble rubs	Double rubs	Dble rubs
Hand-coated papers, coated on one side only, air dried before spraying, not calendered coating; clay, 100 parts; glue (medium-grade, blended), 12.2 parts; water 159 parts.														
Stock B S	54.3	....	....	..	....	30.2	50.4	....	....	....	...	...	..	...
1	92.0	37.7	70.1	..	....	29.6	50.8	....	....	....	...	...	..	...
2	91.0	36.7	67.6	2	....	31.1	50.8	....	....	....	...	...	..	...
3	92.8	38.5	71.0	5	....	32.1	52.8	....	....	....	...	...	..	...
4	91.0	36.7	67.6	8	....	34.0	53.4	....	....	....	...	...	..	...
5	86.3	32.0	59.4	10	....	36.3	54.4	....	....	....	...	...	..	...
Stock D C	50.0	....	....	..	....	....	70.2	....	14.2	....	...	...	..	...
6	93.0	43.0	86.0	..	....	....	69.6	....	15.9	....	...	...	..	...
7	98.8	48.8	97.6	2	....	....	71.5	....	16.0	....	...	...	..	...
8	104.1	54.1	108.2	5	....	....	75.5	....	16.2	....	...	...	..	...
9	106.9	56.9	113.8	8	....	....	77.4	....	16.4	....	...	...	..	...
10	104.3	54.3	108.6	10	....	....	77.8	....	15.8	....	...	...	..	...
11	108.6	58.6	117.2	5a	....	....	79.8	....	16.9	....	...	...	..	...
(a–Sprayed very heavily.)														
Hand coated papers, coated on one side only, sprayed before air drying, not calendered; coating as above.														
1 Coated on Stock B S	92.0	37.7	70.1	..	....	....	50.8	....	....	....	...	...	..	...
12	88.4	34.1	62.8	2	....	....	53.5	....	....	....	...	...	..	...
13	96.1	41.8	77.0	5	....	....	58.4	....	....	....	...	...	..	...
14	93.0	38.7	71.3	10	....	....	58.9	....	....	....	...	...	..	...
6 Coated on Stock D C	93.0	43.0	86.0	..	....	....	69.6	....	15.9	....	...	...	..	...
25	81.5	31.5	63.0	2	....	....	81.6	....	15.5	....	...	...	..	...
26	83.8	33.8	67.6	5	....	....	82.1	....	15.9	....	...	...	..	...
27	91.9	41.9	83.8	10	....	....	83.0	....	18.3	....	...	...	..	...
Hand-coated papers, coated on one side only, not sprayed, formaldehyde added to coating mixture, not calendered as above.														
6 Coated on Stock D C	93.0	43.0	86.0	..	....	....	69.6	....	15.9	....	...	...	..	...
15	94.3	44.3	88.6	..	3.	....	87.2	....	16.5	....	...	...	..	...
16	92.8	42.8	85.6	..	5.	....	94.8	....	17.0	....	...	...	..	...
17	92.0	42.0	84.0	..	10.	....	99.5	....	18.5	....	...	...	..	...
18b	81.8	31.8	63.6	..	....	....	34.5	38.2	20.8	33.7	407	416	70	114
19c	86.5	36.5	73.0	..	5.	....	40.5	46.8	20.9	35.2	109	121	33	86
20c	82.1	32.1	64.2	..	7.5	....	46.7	54.5	21.2	38.3	111	125	40	83
21d	77.9	27.9	55.8	..	5.	....	47.3	52.1	21.3	35.2	120	130	..	...
22d	83.9	33.9	67.8	..	7.5	....	48.1	57.8	21.6	36.7	129	142	..	...
23e	89.4	39.4	78.8	..	5.	....	46.7	53.0	21.1	37.9	81	94	..	...
24e	93.3	43.3	86.6	..	7.5	....	48.9	56.4	20.7	38.9	53	67	..	...
Semicommercial machine-coated papers, coated on one side only, calendered; no formaldehyde used.														
113f	69.9	19.9	38.0	..	....	....	24.2	24.3	11.8	18.6	14	26	55	81
114g	70.0	20.0	40.0	..	....	....	24.0	23.8	12.5	21.8	36	46	37	52
115h	64.9	14.9	29.3	..	....	....	24.4	24.4	15.9	23.7	21	36	51	85
116i	103.3	53.3	106.6	..	....	....	37.0	37.6	28.7	46.2	41	49	79	96
Commercial machine-coated papers, coated on both sides, calendered.														
31j	70.0	....	....	..	....	....	26.7	27.1	25.0	20.9	28	42	39	92
32k	80.0	....	....	..	....	....	41.6	43.9	46.3	34.2	34	55	34	85
33l	67.7	....	....	..	....	....	24.3	25.8	21.4	20.5	...	...	32	56
34l	61.0	....	....	..	....	....	20.2	19.3	27.3	19.0	...	...	31	74
35l	78.4	....	....	..	....	....	21.4	21.5	18.5	24.0	...	...	32	66
36l	97.0	....	....	..	....	....	39.7	37.6	52.3	62.2	...	...	53	120
	51.0	....	....	..	....	....	14.6	14.5	17.6	21.3	...	...	38	66
38m	55.0	....	....	..	....	....	22.2	22.5	20.8	18.4	...	...	28	54
39m	65.0	....	....	..	....	....	24.7	23.8	33.0	31.4	...	...	36	80
40m	105.0	....	....	..	....	....	34.3	33.4	29.6	28.5	...	...	70	88

Note

b Coated on stock X

c Coating applied after standing 4 hours at 85 degrees F

d Coating applied after standing 7½ hours at 85 degrees F

e Coating applied after standing 24 hours at 85 degrees F

f Coating; 74.1 parts clay, 25.9 parts satin white, 12.2 parts medium grade glue, 258 parts water.

g Coating: 74.1 parts clay, 25.9 parts satin white, 17.7 parts casein, 2.7 parts casein solvents, 258 parts water.

h Coating; 100 parts clay, 20 parts low-grade bone glue, 200 parts water.

i Coating; 57.6 parts clay, 42.4 parts blanc fixe, 12.6 parts good grade hide glue, 161 parts water.

j Casein-bound; single coated.

k Casein-bound; double coated.

l Casein-bound.

m Starch-bound

n Adhesive not known.

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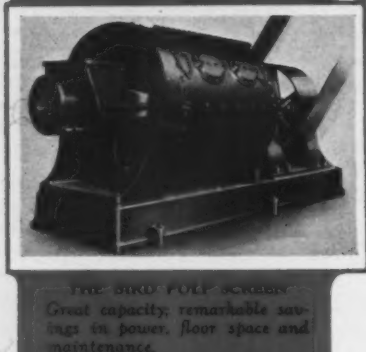

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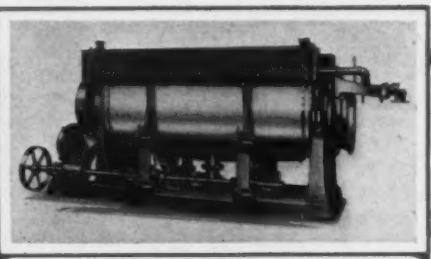

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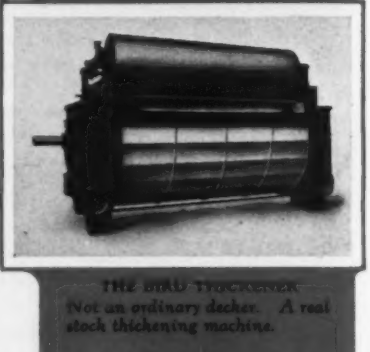

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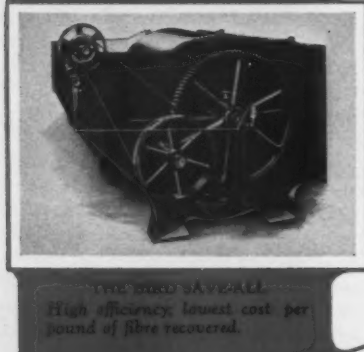

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TABLE 2

COMPARISON OF WATER RESISTANCE TESTS OF COATED PAPERS MADE BY ONE OBSERVER ON DIFFERENT DAYS

Lot number	Indicator method (pontacyl acid scarlet) — Coat side down						Indicator method (pontacyl acid scarlet) — Coat side up					Curl method — Coat side down					Curl method — Coat side up				
	10/26 Sec.	10/30 Sec.	11/2 Sec.	11/6 Sec.	11/8 Sec.	Average Sec.	10/30 Sec.	11/2 Sec.	11/6 Sec.	11/8 Sec.	Average Sec.	10/28	10/30	11/2	11/6	Average	10/28	10/30	11/2	11/6	Average
113	25.2	...	20.7	25.1	25.6	24.2	...	21.9	24.7	26.2	24.3	...	...	10.0	12.6	11.8	...	...	17.1	20.1	18.6
114	27.9	21.9	20.7	24.9	24.8	24.0	22.3	22.3	25.0	25.7	23.8	...	13.4	11.1	13.1	12.5	...	22.5	20.2	22.8	21.8
115	25.0	21.8	21.9	27.3	25.8	24.4	22.5	22.1	26.9	26.1	24.4	15.5	16.6	14.9	16.4	15.9	23.5	23.9	20.8	26.5	23.7
116	...	...	...	37.4	36.6	37.0	...	...	38.0	37.2	37.6	...	...	...	28.7	28.7	...	...	...	46.2	46.2

test piece. There appeared to be slight differences in the rates of color development when more than one dyestuff was used and so in later work but one indicator, pontacyl acid scarlet, was used.

In Table 2 are given the results of tests of four coated papers made on several different days by the same observer under standard humidity and temperature conditions and with the same artificial light. Although there are noticeable differences in the tests of the respective papers from day to day, the results are fairly consistent. However, when similar tests were made under parallel conditions by a second observer as shown in Table 3, the results varied sharply, not only in numerical value but, in the case of lot number 115, in the relation of this paper to the others. There appear to be considerable variations in the

TABLE 3
COMPARISON OF WATER RESISTANCE TESTS OF COATED PAPERS BY DIFFERENT OBSERVERS, INDICATOR METHOD, COAT DOWN

Lot Number	Observer A Seconds	Observer B Seconds
113	24.2	14.5
114	24.0	15.0
115	24.4	19.1
116	37.0	28.2

test results obtained by different observers even under similar test conditions but as a rule the relative values assigned to different samples in any one series of tests are fairly comparable. The reason for such variations seems to be that different persons take different degrees of the color development as the end points of the tests. Also, this end point seems to vary with changing light conditions, as when daylight is used.

In some of the uncalendered, hand-coated samples there were noticeable differences in the degree of water resistance when the indicator was applied respectively to the uncoated and coated sides of the paper. The calendered semicommercial samples tested practically the same with either surface resting on the water, but in a number of the calendered commercial papers, coated on both sides, this "two-sided" effect was observed.

In general the results of the tests by the indicator method were as expected from the data regarding the samples. With glue-bound papers the water resistance increased with progressive additions of formaldehyde. In nearly all cases the water resistance increased with increased weight of coating. However, possible differences in the degree of sizing of the stock coated must be considered. Comparable semicommercial papers, coated respectively with glue and casein, without formaldehyde in either case, had practically the same degree of water resistance. Semicommercial glue-bound papers compared favorably in this respect with commercial coated papers of the same weight.

From the results of these tests it appears that the indicator method of determining the degree of sizing of paper may be applied to compare the relative resistances to the transudation of water of different coated papers. The test results are comparative and not absolute as it appears that the human element of a considerably varying color sense affects the end point taken by different observers.

(*b*) *Curl Method*

For strictly comparable tests of similar papers the curl method is preferred to the indicator method for determining the degree of sizing. Since the end point is sharply distinguishable the personal factor of the observer's color sense does not enter into the operation of the curl test and changing light conditions do not affect it. For this reason there is generally fair agreement in the test results by different observers. However, in applying this test to tub-sized and especially processed papers, or to air-dried papers, it has appeared that conditions other than the mere wetting of the samples affect the test results.

As was to be expected from the nature of the materials, similar difficulties arose in applying the curl method to the testing of coated papers. The curl method necessarily assumes a reasonable uniformity in composition and structure through the thickness of the sheet in order that the reversal of the curl may take place when the water has reached halfway through. But with a sheet made up of dissimilar laminae having no fixed relation in thickness, it is to be expected that a marked "two-sided" curl should be shown. With semi commercial papers, coated on one side only, there were consistent and relatively large differences between the respective test results when the coated and uncoated sides of the papers were in contact with the water. This is possibly due to a lag in the initial wetting of the uncoated side. Of a number of commercial coated papers, coated on both sides, those that had shown the "two-sided" effect when tested by the indicator method generally showed it rather exaggeratedly by the curl method. The results obtained by the curl method seemed to be affected by such things as the strains set up within the paper by drying, the variations in resiliency between coatings made from different materials, and the processes used in finishing the papers. The results were not always consistent as compared with those obtained by the indicator method (see Tables 1 and 2) and in some cases the tests seemed to be unduly affected by heavier coatings.

These studies indicated that though the curl method may be used for comparing the water resistance of coated papers made of like materials and under similar conditions, it is not as applicable for general use as the indicator method.

(*c*) *Wet-Rub Tests.*

As noted in Table 1. when the test pieces of coated papers for wet rubbing were wet in the manner ordinarily used for testing two-sized papers, the results were irregular and rather inconsistent. Samples of the hand-coated paper from lot number 18, glue-bound and containing no formaldehyde, resisted wet rubbing very much more than similar papers in which the glue was tanned with formaldehyde. This incident raised the question of whether or not the effect of water on the unhardened glue was to lubricate the surface being tested.

When the test pieces were kept only slightly moist while being rubbed the results of the individual tests were more uniform and the average results more consistent.

Although the results from this method of testing are directly influenced by the weight of coating as well as the resistance to water of the coat, it seems possible that the wet-rub test might be standardized to give valuable comparisons of the behavior of different coated papers under such conditions as might possibly be encountered in lithographing or under unusual atmospheric conditions.

(*d*) *Comparison of Several Methods of Testing*

Samples of semicommercial papers coated on one side, together

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with samples of commercial glue-bound and casein-bound papers, likewise coated on one side, were tested for comparison by several methods. Many of the commercial papers were colored and the degree of finish, or gloss, varied considerably between the different lots. The indicator method was applied with the coated surfaces in contact with the water. "Smudging" tests were applied by rubbing the coated surfaces with a moistened white cloth until the color was loosened. The resistance of the coating to lifting was checked by the moistened-thumb and sealing-wax pick tests.

As shown in Table 4, there appeared to be no fixed relationship between the different tests of the respective papers. A relatively high degree of resistance by the indicator method was shown by some papers that smudged easily (for example lot number 41). On the other hand, a paper that had low water resistance (lot number 52) did not smudge and met the moistened-thumb and sealing wax pick tests satisfactory. Nearly all the samples gave satisfactory pick-tests with sealing wax but a considerable number lifted more or less on the moistened-thumb. Highly calendered and slippery feeling papers seemed to be much more smudge-proof than dull finished ones. In testing some of the highly finished papers the sealing-wax would not stick to the coated surface.

The lack of relationship between the tests by these different methods is not surprising. Each method measures to some extent a different property of the paper although some of these properties overlap in character. These test results are reported in full in order to emphasize the necessity of considering the test method and its relationship to the use of the paper in discussing the relative merits of various coated papers.

III. Effects of Formaldehyde on the Water Resistance of Glue-Bound Coated Papers

1. Test Methods

The effects of formaldehyde on the water resistance of glue-bound coated paper were studied in the laboratory through the preparation and testing of hand-brushed coated sheets. The body stock used was generally made in the Bureau's experimental paper mill although a number of tests were made with commercial coating stocks. The coating mixture generally used consisted of 100 parts of imported clay, 12 to 15 parts of a medium-grade, blended glue[1], and 160 parts of water. A number of tests were made using other grades of glue. No soaps, waxes or water proofing agents other than formaldehyde were used in any of the experiments. The proportions of formaldehyde used were calculated as 100 per cent formaldehyde (not the commercial 40 per cent solution) and were based on the weight of glue present when added to the coating mixtures. Spraying solutions were measured as per cent concentration of 100 per cent formaldehyde.

In one series of experiments formaldehyde solutions of different concentrations were sprayed on the air-dried, hand-coated sheets. These trials were followed by others in which the formaldehyde solutions were sprayed on the freshly coated surfaces before air drying. In a third series of tests, different percentages of formaldehyde were added directly to the coating mixture before applying the material to the paper. Hand-brushed samples were also prepared from glue-bound coating mixtures in the study of the effects of formaldehyde on the viscosity and working life of such materials.

The experimentally coated papers were generally tested for water resistance by the indicator method and several were used for the comparisons of different test methods.

2. Discussion of Results

A summary of typical test results of the effects of formaldehyde on increasing the water resistance of glue-bound coated papers is included in Table 1. As shown in this table, when hand-coated, glue-bound sheets were air-dried before being sprayed with formaldehyde solutions, small but consistent improvements in the water resistance took place when increasing amounts of formaldehyde were applied. The amounts of formaldehyde were regulated by spraying under standard conditions with varying concentrations of formaldehyde in the spray solution. In a second series of tests, the formaldehyde solutions were sprayed onto the freshly coated surface whereupon further enhancement of the water resistance took place. The dried sheets from this second series showed a serious defect in that the coating was frequently pitted and roughened by the penetration of the spray particles into the coating surface. This condition may be easily remedied and outside advices that in European practice in order to avoid this difficulty either very fine sprays or formaldehyde vapor are used; or the coated paper is partially dried before applying the glue-hardening reagent.

A number of tests were made in which different percentages of formaldehyde, based on the weight of glue, were added to the coating mixture before coating the paper. The increase in water resistance obtained by thus incorporating the glue-tanning material in the coating mixture were even more marked than when the formaldehyde was applied to the coated surfaces. The effects of formaldehyde additions by these three methods on the water resistance of glue-bound coated papers are shown graphically in Fig. 1. Reference may be made to Table 1 for a comparison of the water resistance of these formaldehyde-treated glue-bound papers with that of ordinary commercial coated papers.

Other experiments made in this investigation and in a study of the tub-sizing of paper with animal glue, as well as information

[1] Jell-strength 228 grams, viscosity 68 millipoises, as measured by the standard methods of the National Association of Glue Manufacturers. Standard methods of glue testing: Ind. and Eng. Chem., 16, No. 3, pp. 310-315, March, 1924.

TABLE 4.—COMPARISON OF DIFFERENT METHODS OF TESTING COATED PAPERS

Lot No.	Color	Coating adhesive	Degree of sizing, indicator method, coat down sec.	Smudges	With moistened thumb	Sealing-wax pick test
113	White	Glue	14.5	Easily in 10 seconds	Lifts	Tears paper slightly
114	White	Casein	15.0	Slightly in 15 seconds	Lifts slightly	Tears paper
115	White	Glue	19.1	Slightly in 10 seconds	Lifts very slightly	Tears paper
116	White	Glue	28.2	Slightly in 10 seconds	Lifts very slightly	Tears paper nearly through
41	Black	Glue	30.1	Easily in 5 seconds	Neither lifts nor shows color	Tears paper some, lifts some. Difficult to "stick" wax on sample.
42	Violet	Glue	21.4	Immediately	Lifts	Tears paper through
43	Pink	Glue	21.3	Easily in 10 seconds	Discolors very slightly	Tears paper through
44	Blue	Glue	19.2	Easily in 5 seconds	Lifts slightly	Tears paper nearly through
45	Crimson	Glue	25.4	Immediately	Shows color, lifts very slightly	Tears paper nearly through
46	Crimson	Glue	49.9	Slightly in 30 seconds	Neither lifts nor shows color	Tears paper nearly through
47	Blue	Glue	21.5	Immediately	Lifts very easily	Tears paper through
48	Red	Glue	50.4	Slightly in 10 seconds	Shows color slightly	Wax would not stick to paper
51	Gray	Casein	17.1	Barely in one minute	Lifts slightly	Tears paper nearly through
52	White	Casein	14.5	None in one minute	Neither lifts nor shows color	Tears paper through
53	Light Blue	Casein	16.6	Slightly in 10 seconds	Lifts very slightly	Tears paper nearly through
54	White	Casein	17.0	None in one minute	Lifts slightly	Tears paper nearly through
55	Pink	Casein	25.9	Slightly in 30 seconds	Shows color very slightly	Tears paper through
56	Magenta	Casein	22.5	Slightly in 15 seconds	Neither lifts nor shows color	Wax would not stick to paper
57	White	Casein	17.6	Doubtful in one minute	Neither lifts nor shows color	Tears paper
58	Pale Blue	Casein	18.0	Slightly in 30 seconds	Lifts very slightly	Tears paper
59	Purple	Casein	16.5	Immediately	Shows color slightly	Tears paper

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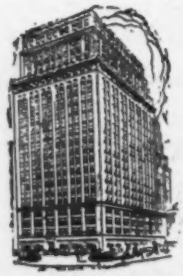

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from other sources, indicate that the tanning effect of formaldehyde on glue, which renders glue water resistant, varies with different grades of glue. In general the higher grades of glue require less of any tanning agent than the lower grades in order to develop the same degree of water resistance. Similarly, hide glues seem to require less tanning agent than bone glues.

Observations of the use of formaldehyde with glue in tub-sized papers and in the wood-working industries indicate that the hardening action of formaldehyde on glue progresses slowly but appreciably for some little time after the reaction starts. This fact should be remembered in testing products into which the formaldehyde-glue reaction enters.

IV. Viscosity and Working Life of Glue-Bound Coating Mixtures

1. Test Methods

In order to study the effects of formaldehyde on the length of the working life of glue-bound coating mixtures a series of laboratory trials were made to observe the viscosity of such mixtures, without and with added formaldehyde at different temperatures and at different ages of the mixtures. Since there was a possibility of the formaldehyde forming an irreversible gel with the glue, a Stormer[3] viscometer was used for these tests. The parts of this instrument are readily removed for cleaning and there are no capillary tubes which might become blocked. A cylinder is rotated in the liquid under examination by the action of a falling weight. The time required for the cylinder to make a specified number of revolutions in the material being tested and in water offers a means for comparing the respective viscosities. A water or oil bath surrounds the cup that contains the sample, thus permitting the tests to be made at any desired temperature and a counting device notes the revolutions of the cylinder.

Coating mixtures similar to those noted in the previous section were generally used for these experiments. The time and temperature factors were so varied as to indicate conditions that would be encountered in commercial coating practice. Following such tests of plain glue-bound coating mixtures, different percentages of formaldehyde were added and the results observed under conditions similar to those of the blank trials.

2. Discussion of Results

When tanning agents, such as formaldehyde, are added to glue solutions, the glue solutions tend to set as irreversible gels. The speed of such reactions depends upon the kind, grade, and concentration of glue, the concentration of formaldehyde, and the temperature. Those glues which require relatively small amounts of formaldehyde in order to reach a high degree of water resistance and which reach a relatively high degree of water resistance with a specified amount of formaldehyde tend to thicken and form such irreversible gels more readily than lower grade glues. The presence of clay or similar pigment possessing to some degree the dispersive powers of colloids tends to retard the action of formaldehyde on glue.

[3] Nyling, Walter A., Starches, pp. 14-15, Bau-Erhardt Press, Inc., New York, 1924.

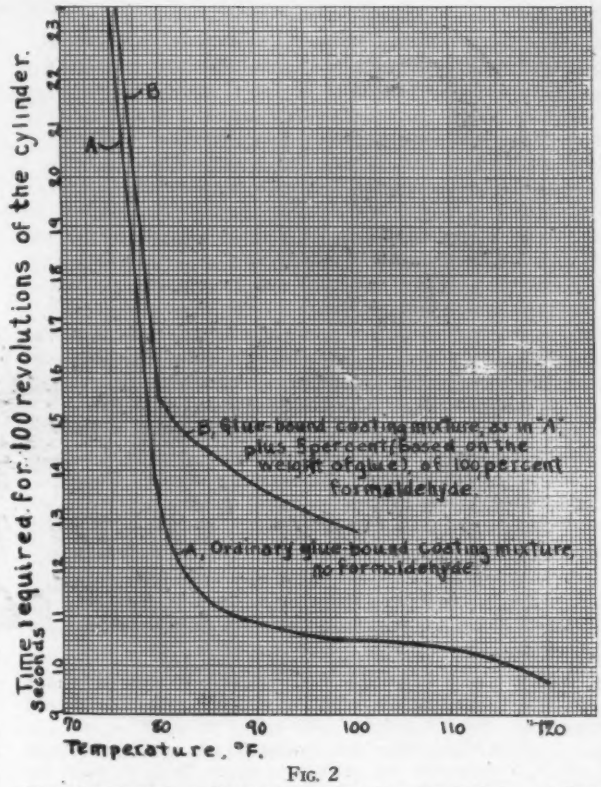
Time required for 100 revolutions of the cylinder. Seconds
B, Glue-bound coating mixture as in "A" plus 5 percent(based on the weight of glue) of 100 percent formaldehyde.
A, Ordinary glue-bound coating mixture, no formaldehyde.
Temperature, °F.

Fig. 2

Effect of temperature on viscosity of glue-bound coating mixtures, as indicated by the Stormer viscometer. (For water at 77 degrees F., the time required for 100 revolutions of the cylinder was 5.4 seconds.)

The ease of applying formaldehyde directly with glue-bound coatings mixtures and the consequent freedom from the objectionable odor of formaldehyde led to the study of the viscosity and length of working life of such material. The coating mixture generally used was the same as has been referred to in previous sections.—100 parts clay, 12.5 parts medium-grade blended glue, 160 parts water. The viscosity of this mixture at 85 degrees F. was suitable for either laboratory brush-outs or machine coatings. It changes but slightly on standing for as long as 24 hours at this temperature. Any tendency to gel at lower temperatures was easily corrected, by warming gently or by stirring for a very short time with out apparent injury to the mixture or defect in the coated sheets.

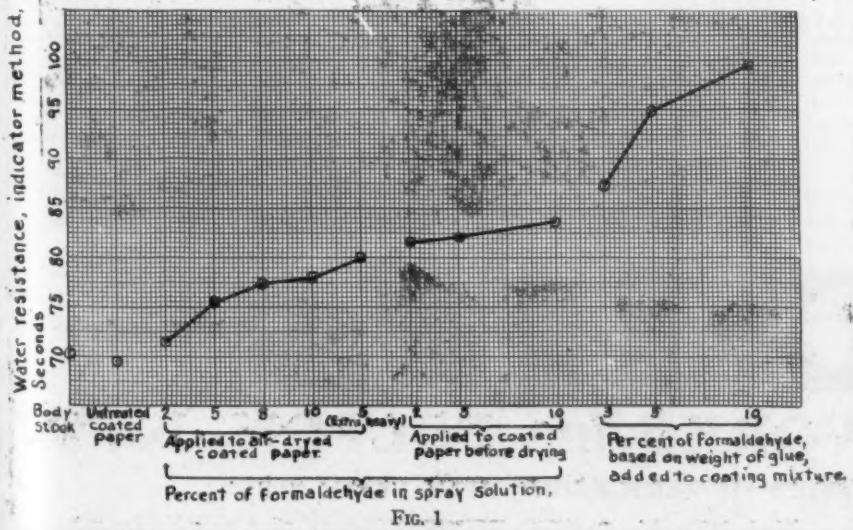
Water resistance, indicator method, Seconds
Body Stock
Untreated coated paper
Applied to air-dryed coated paper
Applied to coated paper before drying
Percent of formaldehyde in spray solution.
Percent of formaldehyde, based on weight of glue, added to coating mixture.

Fig. 1

Effect of Formaldehyde on the water resistance of glue-bound coated papers.

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Laboratory experiments indicated that 12 to 15 per cent of formaldehyde tended to thicken this coating mixture in a short time although at no time was an irreversible gel actually formed. When 10 per cent of formaldehyde was used the coating mixture became too viscous to apply in from four to six hours standing at 85 degrees F. The working life of mixtures containing as little as 5 per cent of formaldehyde was shortened materially by exposure to temperatures above 100 degrees F. When a coating mixture containing 5 per cent of formaldehyde was kept at 85 degrees F. overnight the mass became semisolid and could be tested in the Stormer viscometer only with difficulty. On agitating for only one minute this mixture became sufficiently fluid for use. Similarly, coating mixtures containing from 0 to 7.5 per cent of formaldehyde, which had semigeled on long standing or exposure to lower temperatures became more fluid when agitated for a short time.

The influence of temperature changes on the viscosity of a glue-bound coating mixture without and with the addition of 5 per cent of formaldehyde, is shown in Fig. 2. Laboratory experiments indicated that a coating mixture the viscosity of which was such that not over 20 seconds were required for 100 revolutions of the Stormer viscometer cylinder should give satisfactory coatings, free from brush marks. For water at 77 degrees F., 5.4 seconds are required for 100 revolutions of the cylinder. The viscosity of these coating mixtures decreases very sharply when the temperature is raised from 75 to 85 degrees F. and on further raising the temperature the decrease in viscosity is relatively small. This is important as it has appeared in this investigation that in order to obtain the maximum working life of formaldehyde-glue-bound coating mixtures their temperatures should be kept as low as consistent with their application.

With this coating mixture, based on a medium-grade blended blue, the largest amount of formaldehyde which could be used without adversely affecting the working life at 85 degrees F. was about 8 per cent. For more dilute mixtures or those containing less glue or a lower-grade glue, the amount of formaldehyde could probably be increased if this were desired. For more concentrated mixtures, or those containing more glue or a higher-grade glue, it might be necessary when using so much formaldehyde to coat at a higher temperature in order to diminish the viscosity. Such use of higher temperatures would necessarily shorten the working life of the mixture. It might be pointed out, however, that smaller amounts of high grade glues than of the low grades are required to obtain satisfactory adhesion of the coating to the body stock.

V. Summary and Conclusions

In continuing the study of the use of glue for coating paper consideration has been given methods of testing coated papers for water resistance, the relation of such tests to other tests commonly applied to coatel papers, the improving of the water resistance of glue-bound coated papers by formaldehyde, and the effects of formaldehyde on the viscosity and working life of glue-bound coating mixtures. Hand-brushed test sheets have been prepared in the laboratory and compared with experimental semicommercial and ordinary commercial papers by water-resistance and other tests.

The indicator method appears to offer a satisfactory means of comparing the water resistance of coated papers. The results are not absolute on account of variations in the color sense of different observers. However, fair agreement is generally obtained in the ranking of series of coated papers by different observers. The curl method does not seem to be applicable for general testing of coated papers. It seems possible that the operation of the wet-rub tester might be so standardized as to give valuable information for comparing the behavior of coated papers when used for processes such as lithographing or when exposed to abnormal atmospheric conditions. There appears to be no fixed relationship between the results of tests for water resistance by the indicator method, smudging tests, or resistance to picking or lifting by the moistened-thumb or sealing-wax pick tests.

The water resistance of glue-bound coated papers may be markedly improved either by treating the freshly coated papers with formaldehyde or by adding formaldehyde directly to the coating mixtures. The degree of water resistance possessed by such formaldehyde-treated glue-bound coated papers was comparable with that of the commercial coated papers tested. The proportion of formaldehyde required to obtain a given degree of water resistance varies with the grade of glue.

The viscosity of coating mixtures bound with medium-grade glues is best suited for applying at about 89 degrees F. Such glue bound mixtures, at this temperature may contain from 5 to 8 per cent of formaldehyde based on the weight of glue without unduly shortening their working lives. With larger amounts of formaldehyde or at higher temperatures the working life of such a mixture is shortened. A relatively small amount of agitation generally serves to diminish the viscosity of such mixtures if they tend to thicken. The effects of formaldehyde on the viscosity and working life of glue-bound coating mixtures are influenced by the grade and proportion of glue used and the concentration of the mixture.

Report on Abstracts and Bibliography

Clarence J. West, Chairman

During the year 1926 there appeared in the columns of the Technical Section of the PAPER TRADE JOURNAL the following contributions from the Committee:

Abstracts: 45 pages in volume 82 and 62 pages in volume 83, a total of 107 pages as compared with 77 for the year 1925 and 78 for the year 1924.

The Annual Bibliography of Paper Making for 1925, reprinted in the Technical Association Papers 9: 182-214.

A supplement to the publications of the Bureau of Standards covering the year 1925.

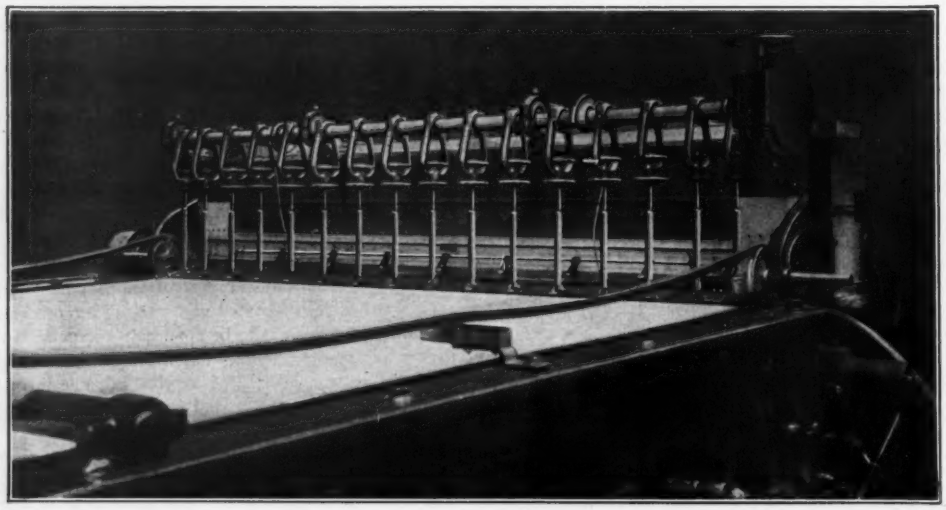
Indexes of the Technical Section for volumes 82 and 83.

There has been about the usual number of requests for information, and the Chairman regrets that he has not always been able to give the time to answer some of them properly. Many photostats have been supplied at cost through the courtesy of the National Research Council.

The Chairman wishes to emphasize the untiring and unselfish services of his co-workers, A. Papineau-Couture and Dr. John L. Parsons, both of whom have cooperated faithfully and well in making possible the publication of the Abstract Section. As an examination of the pages will show, practically all the abstracting is done by these two men. M. L. Caust has not been able to secure Russian journals during the past year, but steps are being taken to remedy this. The chairman is also pleased to report that arrangements have been completed for abstracting the Scandinavian journals regularly, and it is expected that many of the important articles will be translated and published in the Technical Section.

Collective Bibliography

Work on the Collective Bibliography has not progressed as rapidly as it should, owing to the many demands made upon the time of the Chairman. The apparent need for this work, as voiced by the research workers in the industry, will certainly act as a stimulus to the Committee and it is hoped that a more favorable report may be rendered next year.



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Soda Pulp Investigations

II—Yield and Quality of Pulp Obtained from the Birches and Maples [1]

By D. E. Cable, R. H. McKee and R. H. Simmons [2]

Because of the growing interest in the utilization of hardwoods for the manufacture of soda pulp, it has been deemed advisable for the Research Department of the Oxford Paper Company to investigate quite carefully the pulping characteristics of those hardwoods of commercial importance found growing in western Maine and New Hampshire.

This report will describe most of the work which we have done on the soda pulping of white birch (*Betula papyrifera*), yellow birch (*Betula latea*), silver maple (*Acer saccharinum* L.), hard maple (*Acer saccharum Marsh*), and red maple (*Acer rubrum* L.).

A historical review, dealing with the subject of soda pulp from

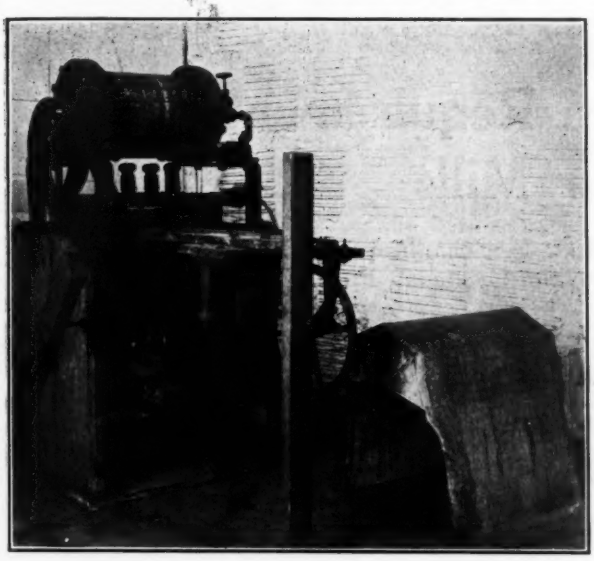


PLATE 1

Experimental Rotary Soda Digester (gas heated) and Sheet Iron Hood which is placed over it during a cook.

hardwoods, can very easily be made, because of the limited number of articles published on this branch of soda pulp manufacture. Fowler has described[3] his experimental results in the making of soda pulp from six kinds of Australian hardwoods. None of the woods which he studied belong to the birch or maple groups. In spite of this, however, the following statement which he makes is of interest to us:

"The surprising fact was developed that the hardwood sheets were actually stronger, in almost every respect than a sheet of good office envelope and bond writing papers selected at random from office stock."

In our previous report[4] we mentioned two references on the making of soda pulp from hardwoods which deserve repetition at this point. The one[5] has to do with the erection of a soda pulp mill which will manufacture soda pulp from a mixture, consisting of 75 per cent hard maple, and the remainder of ash, oak and other hardwoods. The other reference[6] mentions the intended use of birch by the mill now known as the Tonawanda Paper Company.

The most extensive experimental work on the production of soda pulp from many species of hardwoods has probably been done by the U. S. Forest Products Laboratory. The results are briefly summarized in a recent series of articles, entitled, "American Pulpwoods"[7] by S. D. Wells.

In Table 1 is given all the critical data presented by Wells on soda pulp from aspen and five species of birches and maple.

Experimental Work

The apparatus and methods used in obtaining the experimental results tabulated in Table 2 of this report are those described in our previous reports[8], [4]. Plate 1 shows a photograph of our experimental gas heated rotary soda digester and the sheet iron hood which is placed over it, during the cooking operation to help maintain fair constancy of temperature within the digester. A

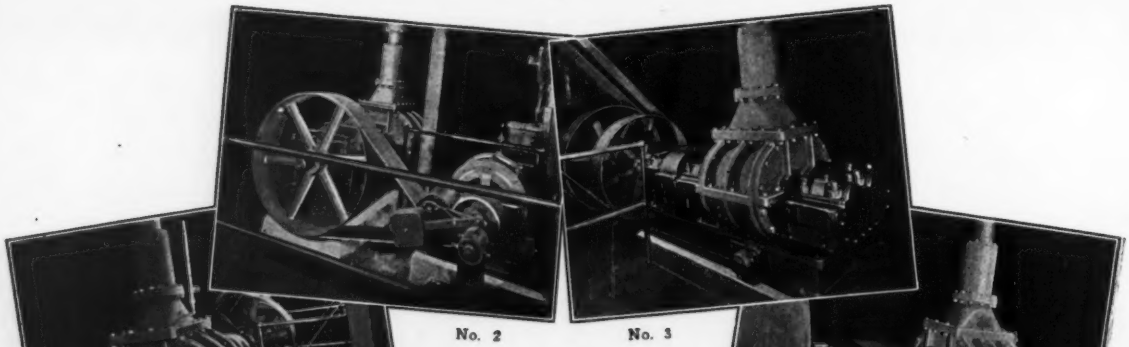
[1] Report presented as Contribution No. 5 from the Oxford Paper Company Research Department, Brooklyn, N. Y.
[2] Members TAPPI.
[3] "Soda Pulp from Australian Hardwoods," Paper 29, No. 8, pp. 24-25 (Oct. 26, 1921).
[4] "Yield and Quality of Pulp as Affected by Length of Chip," by D. E. Cable, R. H. McKee and R. H. Simmons. Paper Trade Journal 83, No. 14, pp. 47-49 (Sept. 30, 1926); Pulp and Paper Mag. 24, No. 42, pp. 1249-52 (Oct. 21, 1926).
[5] Anon. "Hardwood for Paper—Ford Company's Achievement." The World's Paper Trade Review 83, No. 19, 1576 (May 8, 1925).
[6] Anon. "New Soda Mill Will Have Novel Features." Pulp and Paper Mag. 23, No. 28, 774 (July 9, 1925).
[7] Paper Ind. 5, No. 4, 642 ff.; No. 5, 797 ff.; No. 6, 961 ff. (July-Sept., 1923); Paper 32, No. 14, 7-14; No. 15, 6-8, 12, 16, 18.

TABLE 1

Soda Pulp from Aspen and Five Species of Birches and Maples [9] According to Wells [7]

Wood from which pulp was obtained					Pulp obtained	
Common Name	Botanical Name	Specific gravity in lb. per cu. ft. (solid) (ov. dry)	Fiber length (mm.)	Yield per Cord (lb.—oven dry weight.)	Character	Possible Uses
Aspen	Populus tremuloides..	23	1.0	1080	Easily bleached Soft and short fibered	Well adapted for book, envelope, and high grade printings
Paper Birch [10]	Betula papyrifera ..	34	1.2	1350	More difficult to reduce than aspen; soft; easily bleached and opaque	Similar to aspen
Yellow Birch	Betula latea...	34	1.5	1360	More difficult to reduce than aspen; soft; easily bleached	Same as aspen
Boxelder	Acer negundo .	30	--	1300	Easily pulped Rather difficult to bleach; soft, opaque and short fiber.	Same as aspen
Red Maple	Acer rubrum .	30	0.8	1300	Easily pulped and bleached; Soft, opaque and short fiber.	Same as aspen
Sugar Maple	Acer saccharum	35	--	1500	More difficult to pulp and bleach than aspen; soft and opaque; short fiber.	Same as aspen

[7] See footnote elsewhere
[9] Apparently no work has been done at the Madison Laboratory on the cooking of silver maple.
[10] This is commonly called "Canoe birch" or "White birch" in Maine.



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No. 2—Cycloidal Vacuum Pump for Felt Conditioner.
No. 3—Cycloidal Vacuum Pump for Suction Press Roll.
No. 4—Cycloidal Vacuum Pump for Suction Couch Roll.

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TABLE 2
Data on Rotary Soda Cooks of Birches and Maples

Experiment No.	Kind of Wood	Length of chips (with the grain) in.	Air Dry Weight of chips taken grams	Moisture Content of chips %	Equivalent Oven Dry Weight of chips—grams	Volume Cooking liquor taken 15 liters.	Ratio of NaOH to bone dry chips	Causticity %	Total time of cook hr.	Time at maximum temperature.	Yield of pulp (Ov dry basis, pulp & chips) %	Screenings %	Bleach (35% av. Cl) requirement of pulp (Ov dry basis [28]) %	Loss in wt. on Bleaching—%
8	White birch (WB1)	7/8	2268	6.8	2114	7.80	0.244	97.0	6½	5½	47.2	— —	12.9	2.6
9	White birch (WB1)	1	2268	5.0	2154	7.80	0.240	97.0	6½	5¼	47.2	— —	13.5	2.0
18	White birch (WB1)	1	2268	5.2	2155	8.30	0.250	97.0	4½	3½	46.7	0.01	12.9	2.2
19	Yellow birch (YB2)	¾	2268	8.4	2080	8.00	0.250	97.8	6	5	48.6	0.03	13.5	1.7
20	Yellow birch (YB2)	¾	2268	8.4	2080	8.00	0.250	80.4	6	5	46.0	0.09	16.3	1.7
21	Yellow birch (YB2)	¾	2268	8.4	2080	8.00	0.250	80.3	6	5	47.6	0.06	12.5	2.50
22	Yellow birch (YB2)	¾	2268	7.6	2098	8.00	0.248	60.0	6	5	47.3	0.01	15.4	1.5
23	Yellow birch (YB2)	¾	2268	8.4	2080	8.00	0.250	97.8	6	5	44.5 [27]	0.09	15.2	1.5
24	Yellow birch (YB2)	¾	2268	8.0	2090	8.00	0.249	97.8	4½	3½	46.5	0.07	15.9	2.8
25	Yellow birch (YB2)	¾	2268	7.5	2100	8.07	0.250	97.8	4	2⅝	46.2	0.08	14.2	2.6
26	Yellow birch (YB2)	1	2268	10.9	2020	7.80	0.251	97.8	4	3	47.9	0.07	14.1	2.5
10	Silver maple (WM)	½	2268	6.6	2118	7.80	0.244	97.0	7	5½	44.5	— —	12.7	2.3
16	Silver maple (SM2)	¾	2268	11.4	2030	7.75	0.252	97.0	6	5	44.7	— —	12.9	1.8
27	Silver maple (WM)	½	2268	6.6	2118	7.80	0.243	97.0	4⅝	4	46.1	— —	15.1	2.0
15	Silver maple (SM2)	¾	2268	11.4	2030	7.75	0.252	97.0	4½	3½	44.0	— —	11.9	2.0
75	Hard maple (HM)	¾	1500	4.8	1430	5.50	0.250	97.8	6	5	43.3	0.13	14.6	2.2
76	Red maple (RM)	¾	2268	6.5	2120	8.15	0.250	97.8	6	5	43.2	0.04	13.4	1.0

[26] The cooking liquor was of such a concentration as to contain 65.0 grams of sodium hydroxide per liter for all cooks except Nos. 8, 9, 10, 15 and 16. The liquor in the latter cooks had a concentration of 66.1 grams per liter.
[27] Yield not comparable with other cooks because of unique pulp washing conditions.
[28] Pulps Nos. 18, 21, 25, and 26 were bleached with a liquor having an available chlorine normality of 0.7725. Pulps 75 and 76 were bleached with a liquor, having an available chlorine normality of 0.432. All other pulps were bleached with a liquor, having an available chlorine normality of 0.6225. The free lime ($Ca(OH)_2$) normality of the bleach liquors in every case was 0.0357.

sketch of this digester was presented in our article[8] of February 25, 1926.

Wood Used

The soda pulps described in this report were obtained from two sound logs of silver maple (Specimens WM and SM2) and one log from each of the species, white birch (WB1), yellow birch (YB2), hard maple (HM) and red maple (RM). The first four logs were selected for us through the courtesy of T. F. Spear from pulpwood on hand at our mill in Rumford, Me. They varied in diameter from 8 inches in the case of the white birch

[8] "Apparatus and Methods for Experimental Investigations on the Production of Soda Pulp," by D. E. Cable, R. H. McKee and R. H. Simmons. Paper Trade Journal 82, No. 8, pp. 158-61; Tech. Assoc. Papers, Series 9 (1926), p. 30.

TABLE 3
Specific Gravities of Woods Used in This Investigation

Kind of wood	Specific gravity of oven dry wood as measured by this laboratory on wood actually used lb per cubic foot (Solid Wood)	Oven dry weight per cord of wood (Calculated) lb.
White birch (WB1)	37.73	3,773
Yellow birch (YB2)	40.8	4,080
Silver maple (WM)	42.19	4,219
Silver maple (SM2)	41.59	4,159
Hard Maple (HM)	37.4	3,740
Red maple (RM)	37.9	3,790

TABLE 4
Analysis of Woods
(Results in Percentages on Basis of Oven Dry Sample)

Species	Sample No.	Ash %	Solubility of sample in: Cold Water %	Hot Water %	Ether %	1% NaOH %	7.14% NaOH %	Acetic Acid by Hydrolysis %	Methoxy Groups (CH_3O) %	Pentosan %	Methyl Pentosan %	Lignin %	Cellulose %	Ash in Cellulose %	Ash free Cellulose %	Pentosan in Cellulose %	Methyl Pentosan in Cellulose %
Aspen (Populus tremuloides) [21]		0.8	2.6	3.5	2.1	20.8	33.9			18.9	0.2	26.6	57.5				
Aspen (P. tremula) [24]		0.32			1.08			4.17	5.93	23.75	0.72	18.2	47.1	(Corrected for pentosan)			
Yellow Birch (Betula latea) [22]	1	0.58	2.88	4.21	0.55	20.02	...	3.99	6.12	24.26	3.18		60.49	0.11	60.38	28.40	1.11
	2	0.57	2.58	3.87	0.67	20.20	...	4.39	6.03	25.40	3.12		61.08	0.12	60.96	29.96	1.32
	3	0.54	3.15	4.66	0.54	19.51	...	3.81	6.19	23.00	2.25		61.82	0.14	61.68	26.55	1.04
	4	0.37	2.06	3.15	0.63	19.65	...	5.02	5.92	25.86	2.21		61.85	0.16	61.69	....	...
	Mean	0.52	2.67	3.97	0.60	19.85	...	4.30	6.07	24.63	2.69		61.31	0.13	61.18	28.30	1.16
Birch (Betula verrucosa) [24]		0.39			0.71			4.65	5.72	27.07	0.84	19.6	45.30	(Corrected for pentosan)			
Sugar maple (Acer saccharum) [22]	1	0.46	2.60	4.27	0.29	16.98	...	4.26	7.22	21.10	2.50		60.78	0.13	60.65	21.08	1.04
	2	0.51	2.73	4.22	0.22	17.20	...	4.25	7.23	21.90	2.14		61.57	0.28	61.39	25.82	1.05
	3	0.40	2.94	4.87	0.30	18.04	...	4.60	7.25	22.21	2.05		60.20	0.33	59.87	25.83	1.00
	4	0.38	2.33	4.15	0.20	18.35	...	4.74	7.28	21.62	2.85		60.48	0.39	60.09	25.20	0.77
	Mean	0.44	2.65	4.36	0.25	17.64	...	4.46	7.25	21.77	2.39		60.78	0.28	60.50	24.48	0.96

[21] U. S. Department of Agriculture Bulletin No. 1298—"Control of Decay in Pulp and Pulp Wood," by O. Kress, C. J. Humphrey, C. A. Richards, M. W. Bray and J. A. Staidl (1925), p. 23.
[22] A. W. Schorger, Jour. Ind. & Eng. Chem. 9, 556-61 (June, 1917).
[24] Schwalbe and Becker, Z. angew. chem. 32, pp. 229-231 (1919). See also "Chemistry of Cellulose and Wood," by Schorger. McGraw-Hill Book Co., New York, p. 37 (1926).
Also—Chemistry of Wood, by Hawley and Wise (1926), p. 184.

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(WB1) to 11 inches in the case of the silver maple (SM2).

The dates on which these mill logs were received at the laboratory were as follows:

White birch (WB1), Dec. 8, 1924; Yellow birch (YB2), Jan. 21, 1925; Silver maple (WM), Nov. 17, 1924; Silver maple (SM2), Jan. 21, 1925.

The logs, hard maple (HM) and red maple (RM) were cut in the field especially for our use and shipped to us from Syracuse, N. Y. by E. J. Schreiner. They arrived at the laboratory on December 13, 1925. The hard maple log (HM) averaged 7 inches in diameter and was taken from that portion of the original tree (height—45 feet) which approximated 20 feet above the ground. The red maple log (RM) averaged 7½ inches in diameter and was taken from that portion of the original tree (height—60 feet) which approximated 30 feet above the ground.

The specific gravities of these various logs as determined in our laboratory by the method of triangular sampling is shown in Table 3.

The chemical analysis of only two of these five species has previously been reported in the literature. Because of the scientific, and to a certain extent the practical significance of these analyses, we present them, together with corresponding analyses for aspen wood and *Betula verrucosa* (European birch) in Table 4. Eventually it is hoped that this laboratory will make similar analyses of American aspen and of the other commercial varieties of birch and maple. Up to the present time, however, we have found it necessary to restrict our activities to problems which have seemed of greater and more urgent importance.

Experimental Results

Table 2 presents in as concise a form as possible the story of all the important rotary soda cooks (with the exception of seven white birch and silver maple cooks which were described in our report of September 30, 1926) made on straight hardwoods in this laboratory up to the present time.

A critical study of this Table leads to several conclusions:

First,—A four or five hour soda cook with a maximum temperature of 170 deg. cent. and an hour to reach that maximum produces a pulp of substantially the same yield and bleaching quality as a cook of about 50 per cent greater duration (6 to 7 hours) so far as our observations on white birch, yellow birch and silver maple up to the present time lead us to believe.

Second,—With birch it is seen that substantially the same yield and bleaching quality of pulp is obtained regardless of the degree of causticity (between 60 and 98 per cent), provided all other variables are kept the same in every case. This conclusion would probably apply equally well for other hardwoods and for aspen. However, it is not advisable to generalize too much from the limited amount of data which we have acquired up to the present time.

TABLE 5

Yields of Pulp per Cord of Wood

Experiment No.	Kind of Wood	Yield of Pulp (oven dry weight of pulp & chips) %	Sp. gr. dry Wood — Oven lb. per cu. ft.—s. g.	Yields of oven Dry Pulp: Unbleached per cord. lb.	Yields of oven Dry Pulp: Bl'chd Pulp per cord lb.	Yields of air-Dry Pulp: Unbl'chd Pulp lb. per cord.	Yields of air-Dry Pulp: Bl'chd Pulp, lb. per cord
8	White birch (WB1) ...	47.2	37.73	1780	1731	1978	1922
9	White birch (WB1) ..	47.2	37.73	1780	1743	1978	1938
18	White birch (WB1) ...	46.7	37.73	1760	1720	1950	1909
19	Yellow birch (YB2) ...	48.6	40.8	1980	1945	2198	2160
20	Yellow birch (YB2)	46.0	40.8	1870	1837	2055	2039
21	Yellow birch (YB2)	47.6	40.8	1939	1890	2150	2098
22	Yellow birch (YB2) ...	47.3	40.8	1925	1896	2138	2104
23	Yellow birch (YB2) ...	44.5	40.8	1810	1781	2008	1979
24	Yellow birch (YB2) ...	46.5	40.8	1891	1839	2100	2040
25	Yellow birch (YB2) ...	46.2	40.8	1880	1830	2084	2030
26	Yellow birch (YB2) ...	47.9	40.8	1940	1890	2152	2099
10	Silver maple (WM)	44.5	42.19	1876	1831	2081	2036
16	Silver Maple (SM2) ..	44.7	41.59	1860	1827	2064	2027
27	Silver maple (WM)	46.1	42.19	1947	1908	2160	2107
15	Silver maple (SM2)	44.0	41.59	1830	1791	2032	1990
75	Hard maple (HM)	43.3	37.4	1620	1583	1798	1757
76	Red maple (RM)	43.2	37.9	1640	1622	1820	1800

TABLE 6

BLEACH REQUIREMENTS OF HARDWOOD SODA PULPS

Experiment No.	Kind of Wood	Date of Cook	Bleach requirement of pulp Amount of bleach (35% available Chlorine) in pounds needed for every 100 pounds unbleached pulp: Based on 100 lb. oven dry pulp lb.	Based on 100 lb. air dry pulp (10% moisture content) lb.
8	White birch (WB1)	12/16/24	12.9	11.6
9	White birch (WB1)	1/ 2/25	13.5	12.2
18	White birch (WB1)	6/22/25	12.9	11.6
19	Yellow birch (YB2)	4/28/25	13.5	12.2
20	Yellow birch (YB2)	5/ 6/25	16.3	14.7
21	Yellow birch (YB2)	12/28/25	12.5	11.3
22	Yellow birch (YB2)	5/22/25	15.4	13.9
23	Yellow birch (YB2)	5/ 4/25	15.2	13.7
24	Yellow birch (YB2)	5/14/25	15.9	14.3
25	Yellow birch (YB2)	7/14/25	14.2	12.8
26	Yellow birch (YB2)	6/10/25	14.1	12.7
10	Silver maple (WM)	11/24/24	12.7	11.4
16	Silver maple (SM2)	5/19/25	12.9	11.6
27	Silver maple (WM)	11/21/24	15.1	13.6
15	Silver maple (SM2)	5/20/25	11.9	10.7
75	Hard maple (HM)	1/ 5/26	14.6	13.1
76	Red maple (RM)	1/19/26	13.4	12.1

Third,—Judging from the limited evidence available it appears that hard maple and red maple give approximately the same yield and bleaching quality of pulp. These species appear to give soda pulp yields of 1.0 to 1.8 per cent less than the silver maple. However, it is impossible to say whether this difference might not be due to experimental error or variation in wood quality within any of these species.

Table 5 presents the yield data of Table 2 in a form which can be more readily appreciated by a soda mill operator.

Table 6 gives data on the bleaching characteristics of our various hardwood soda pulps on both the basis of oven dry and air dry (10 per cent moisture) unbleached pulp.

Discussion

Our attention has been called to the fact that in recent years there has been very marked evidence of pitting of the soda digester covers at our Rumford Mill. It has occurred to us that this localized corrosive action might possibly be caused by the liberation of minute quantities of acetic acid within a soda digester during the cooking operation.

Oeman[13] has made the startling statement that—"The vapors arising during the concentration of waste liquors (black liquors) are often acidic, although the liquor is moderately alkaline." From the values of dissociation constants for water and acetic acid he calculates that there must be undissociated acetic acid in the black liquor, and a larger amount of organic acids, having smaller dissociation constants.

This observation by Oeman explains how it would be possible to have a vapor pocket at the top of a soda digester in which a small amount of volatile acids (such as acetic and formic acids), coming from the wood, are present. Since the caustic soda is non-volatile this slight predominence of the volatile acids in the vapor section of the digester might easily be responsible for the pitting under the digester cover which has been observed at our mill.

[13] "Acid Vapors During Concentration of Black Liquor," Svensk Pappers-Tid. 28, 5-7, 32-5 (1925). Papierfabr. 23, Tech-Wiss Teil 365-9 (June 27, 1925).

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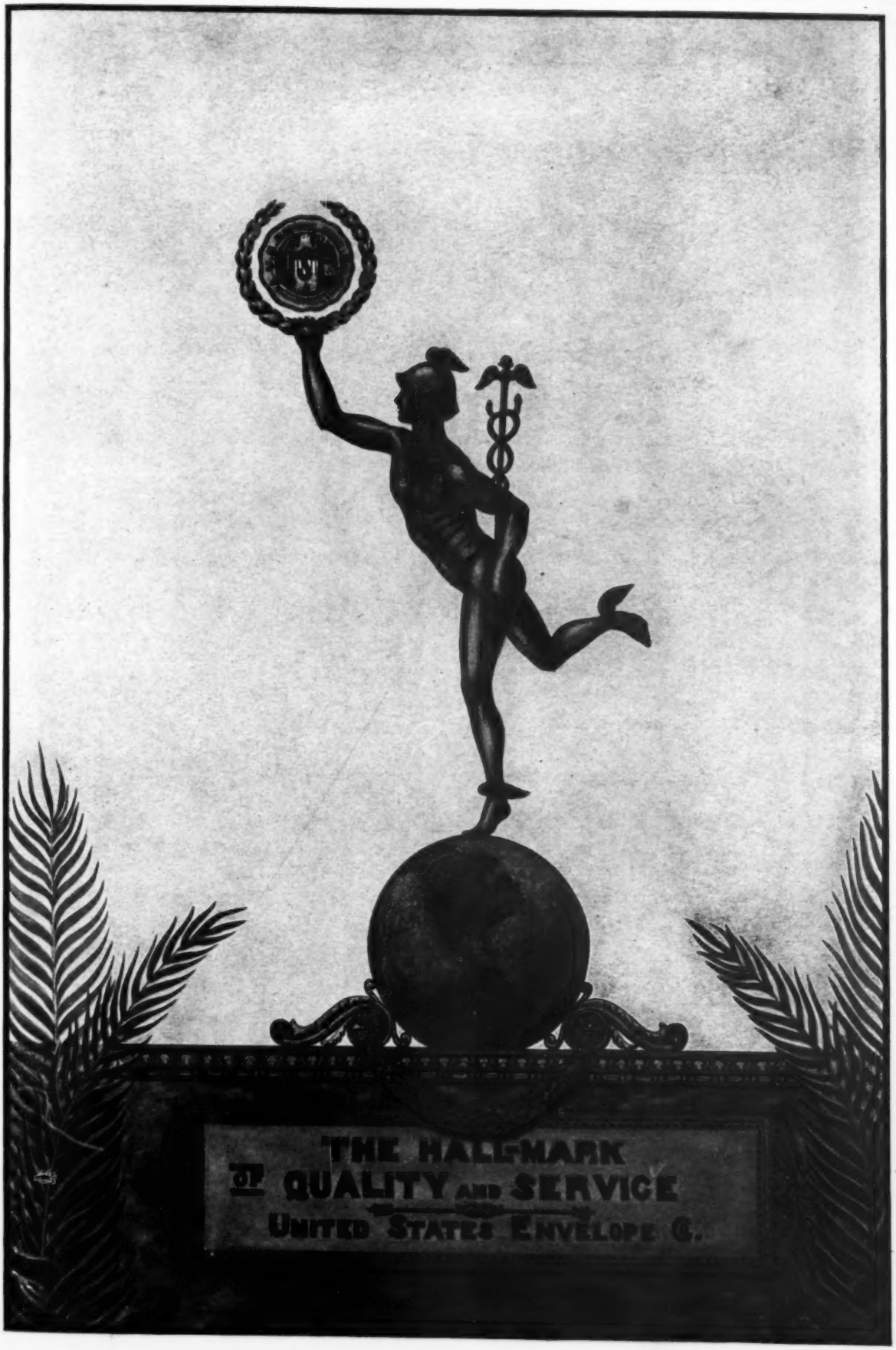
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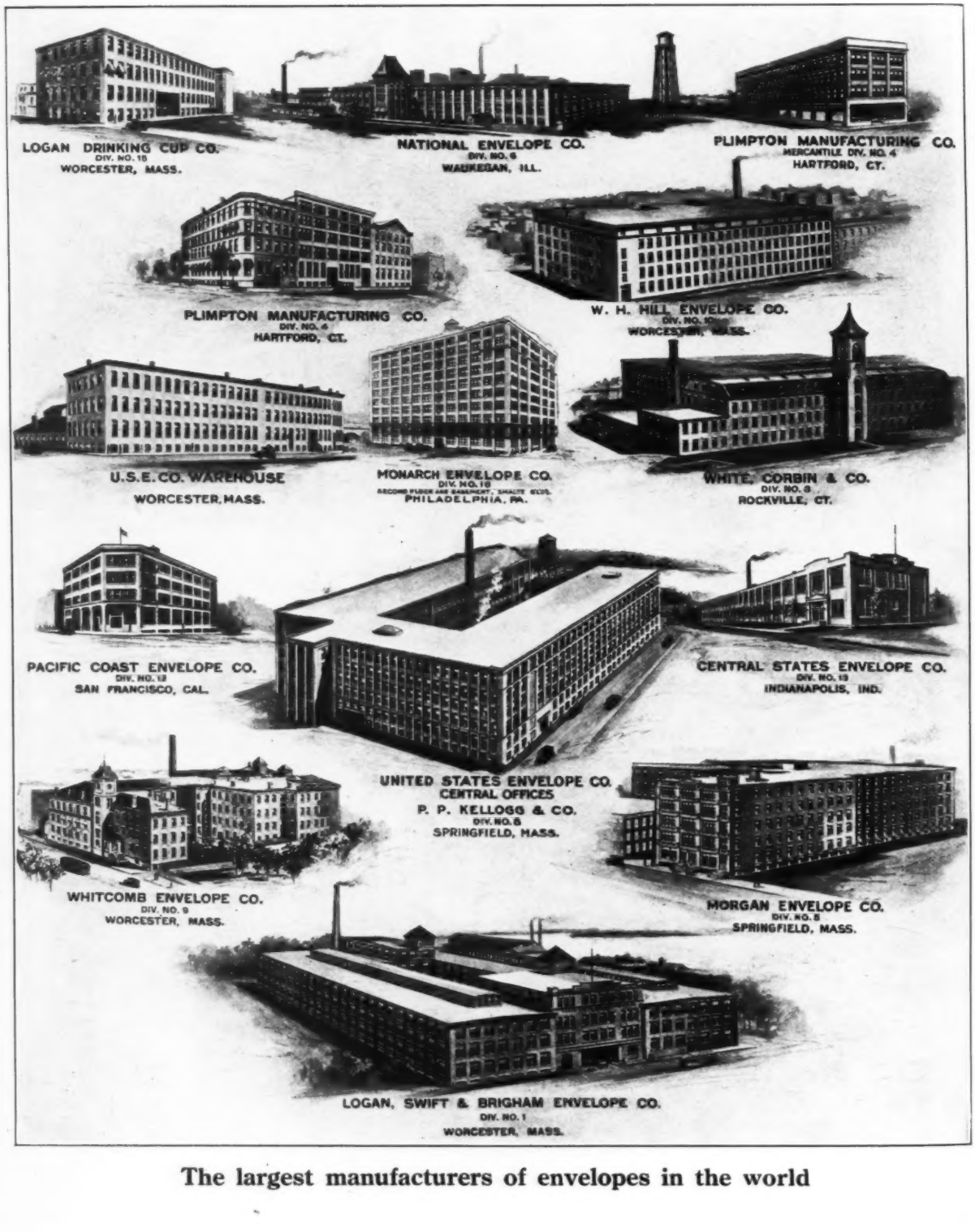

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From Table 4 we see that for every 100 pounds of dry birch or maple wood there may be obtained as much as 4.5 pounds of volatile acids (calculated as acetic acid). It is true that with an excess of alkali present in a solution of these acids we would have these substances largely combined with the sodium as sodium acetate and sodium formate. Yet as Oeman has pointed out there is a measurable amount of uncombined acids present in the solution which when subjected to a steaming operation is permitted to escape from the solution as a vapor.

The Volatile Acids

Whereas, hardwoods such as maple and birch are capable of yielding volatile acids to the extent of about 4.5 per cent of their weight, it has been shown by Schorger [12], that spruce wood yields only about 1.6 per cent of its weight in the form of volatile acids (chiefly acetic). Unfortunately the only information which we have discovered in the literature on the yield of acetic acid (by hydrolysis) from aspen is that given by Schwalbe and Becker for a European wood in Table 4. They obtained a yield of 4.17 per cent which is seen to be slightly less than those values for acetic acid from maple and birches, listed in that same table.

If the American aspen yields as much acetic acid as the European kind, studied by Schwalbe and Becker, there is no reason to grow alarmed about the maples and birches giving considerably more acetic acid on hydrolysis and, consequently, much more trouble from digester cover corrosion, and black liquor evaporation tube corrosion than does the standard soda pulpwood, the aspen.

Yield Value Compared

In comparing our yield values, given in Table 5, with the corresponding ones obtained by Wells and presented in Table 1 it will be seen that our yields are greater than his (on a cord basis) by approximately the following amounts:

White birch, + 30 per cent; Yellow birch, + 40 per cent;
Hard maple, + 8 per cent; Red Maple, + 25 per cent.

A portion of these higher yields may be due to our accidental use of hardwood logs, having decidedly higher specific gravities than those which were used in the soda cooks at the Madison Laboratory. This will be clearly seen by comparing the specific gravities for our logs as given in Table 3 with those logs (whose average gravities are given in Table 1), used at the Forest Products Laboratory.

Whether the logs we received from Rumford, Me. were abnormally heavier or richer in soda pulp substance than normal logs of those same species, growing in Maine and New Hampshire is something that would require vastly more testing than we have done. Rather widely varying physical and chemical properties among trees of a given species grown under different conditions of soil, climate and location have been observed by one of us and by numerous other investigators in the field of forest products.

[12] See footnote at bottom of Table 4.

Consequently, it is a mistake to draw any rigid conclusions, bearing on the superiority of one kind of hardwood for soda pulp as compared with another. At best we can say that the birches and maples give yields on a cord basis which are decidedly greater than those obtained from aspen. Whether the magnitude of this increase in yield (in commercial operation) would approach more closely to the extent indicated by Wells (Table 1) or whether it would approach more closely to the values which we have obtained is a prediction which we are not prepared to make, because of the limited number of our observations and because of the impossibility of a laboratory cook on a 2-pound scale (of pulp) assuring the results obtainable in the Mill on a 6 or 7-ton scale.

For comparative purposes and on the basis of the logs as received by this laboratory our data on yields and quality of hardwood soda pulp is undoubtedly highly reliable.

Acknowledgments

We are very grateful to Messrs. Spear and Schreiner for obtaining and shipping to this laboratory the wood which was used in these experimental soda cooks. We are also indebted to George F. Whiting for having tested all our soda pulps for bleach requirement and loss of weight on bleaching.

Summary

1. This report gives additional information on experimental soda cooks of two species of birch and one of maple. Data obtained in this laboratory on the production of soda pulp from two other species of maple (Hard maple and red maple) are presented for the first time.

2. Critical data on soda pulp from aspen, two species of birch and three of maple as obtained by Wells at the U. S. Forest Products Laboratory are included in this report to serve as a comparison with our data.

3. The variation in total cooking time for white and yellow birch and for silver maple from 4 or 5 hours to 6 or 7 hours has been shown to result in little or no change in yield or bleaching character of the resulting pulp, at least with the type of experimental digester which we are using.

4. We have by our results (on yellow birch) confirmed the observations of other investigators that a variation of causticity in the fresh cooking liquor from 60 to 98 per cent is without perceptible effect on the resulting soda pulp so far as yield and bleaching properties are concerned, providing all other cooking variables are kept constant.

5. The yield and character of pulps obtained from hard maple and from red maple, described in this report, appear to favor their use so far as the limited observations which we have made would permit us to say.

6. Pitting of soda digester covers and corrosion of evaporation tubes [13] should not be much more serious in the cooking of maple and birch than it is at present in the cooking of aspen.

[13] See Technical Association Special Reports (Dec., 1926), p. 105-111.

Report of the Sulphite Pulp Committee

By G. P. Genberg, Chairman

The attention of your Committee on Sulphite pulp has, during the past working year, been directed mainly to three lines of investigation:—

1. The development of a standard method for strength testing.
2. Chip weighing and cooking control.
3. The utilization of sulphite liquor for fuel.

Method for Strength Testing

In view of the developments which took place at the last Annual Meeting and the pressing need for some adopted standard for testing the physical properties of sulphite pulp, your Committee has after a careful study of the matter and a thorough review of previous work, outlined some conditions under which test sheets should be made, pressed, dried and tested for the determination of the initial strength of sulphite. The Committee believes that the conditions outlined are of such a nature that they could be adopted by the Association as standard, and could then serve as a foundation for further work in this very important

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line. The product of the sulphite industry is a material the most important qualities of which are the physical properties, and yet we lack an adopted standard for testing these properties in this the 53rd year of the commercial existence of the industry.

H. P. Carruth Complimented

The working out of the proposed standard test conditions to the extent it has been done has been made possible through the interest shown by H. P. Carruth, a former President of this Association, who has placed the experience of the Mead Pulp & Paper Company in this line of work at the Committee's disposal. The outline has been worked out in close touch with E. P. Cameron of the Forest Products Laboratory of Canada, who presented the method at this year's meeting in Montreal for the consideration of the Technical Section of the Canadian Pulp and Paper Association which approved it.

Laymon's Paper

The proposed standard test conditions were published in PAPER TRADE JOURNAL January 27, 1927, and will be presented for the members' consideration at the Sulphite Sectional Meeting. At this meeting there will also be presented a paper by H. W. Laymon of the Mead Pulp & Paper Co., on the subject of strength testing. E. P. Cameron will talk on a new disintegrator for pulp in dry state and J. D. Rue of the Forest Products Laboratory of Madison will present a paper on a new beating instrument for strength testing purposes. A paper will also be presented on the relation between initial strength of pulp and the strength developed in beating. It is hoped that the proposed standard will be discussed to such an extent at the sulphite meeting that it will be possible to submit it to the Committee on Standard Testing Methods for their action. When considering the method it might be well to bear in mind that pulp is daily bought and sold, accepted and rejected by several large pulp and paper mills on the basis of tests, in which the conditions proposed as standard are strictly adhered to.

Chipweighing and Cooking Control

The fundamental work carried out by the Forest Products Laboratory on sulphite cooking has focused the attention of the industry more and more to means and methods of cooking control, so as to obtain a maximum yield and quality. Control of the cooking process and the product is possible in its fullest extent only, if we can control or at least will know before cooking, the condition and the amount of wood we put into the digesters. Without this control a uniform cooking operation will not result in an uniform product. The fundamental knowledge we are gaining about the process cannot be applied fully to practice without knowledge of the wood we are about to convert into pulp. The logical way to obtain any information in this respect is to determine the weight of the wood per unit volume and the moisture content of each digester charge. The determination of the weight of the wood is of importance not only from the point of view of cooking control, but also, and in the opinion of many of more importance, as a check on the wood supply and ultimate yield.

The weighing of the wood can be accomplished before the wood enters the woodroom or after the wood is chipped and screened.

The first alternative would give the weight of the round wood as a check against the cord measure, but unless the wood room waste is weighed, no reliable result of the amount of wood actually cooked would be obtained.

Importance of Yield Figures

By weighing the chips at the chip bin a result would be obtained which would give, if the actual production is weighed, a figure of the average per cent yield.

If the chips going to the digester could be weighed the advantage of weighing the wood could be utilized to its fullest extent because not only the yield could be determined but a most valuable aid towards cooking control could be gained. The weight of the chips together with the weight of the wood room refuse would also give a check on the measure of the wood received.

The question of chip weighing has been discussed in response to a questionnaire on sulphite cooking sent out by the Committee. The general tendency seems to be towards arriving at some satisfactory way of weighing the wood.

Chip Scale Must Be Designed

There is not at present any mechanical device on the market for the continuous weighing of the chips going into each digester and it is strongly urged that work be directed towards this end.

Seasoning of the wood is another problem in connection with the uniformity of the wood at the time of cooking, by means of which at least the factor of varying moisture would be eliminated. Some woods would not endure storing over much more than six months but the use of pulpwood stored for a period of time in proper rotation is recommended as an aid towards cooking control.

Bleachability Test

Methods are being devised for the determination of the degree of delignification and bleachability of the product. The chlorine number developed by Roe offers the industry a rapid and reliable test for this purpose.

As work for this Committee for next year a study of the various methods at present in use is recommended.

Questionnaires Used

The Committee has during the year been sending out questionnaires with reference to chip weighing, cooking control and other subjects relative to cooking. The responses to these questionnaires have been mimeographed and distributed from the Secretary's office to all members participating in these discussions. Although the responses to a few of these questionnaires were not as many as could have been desired the Committee wishes to thank the members for their interest.

Utilization of Sulphite Liquor for Fuel

The Committee has been in touch with the developments on the problem of the utilization of the waste liquor for fuel. The Committee has been collecting some material on this subject which has been handed over to the Committee on Waste for their information. No such developments have occurred during this year that would warrant a report from this Committee. Some material was collected on the composition of the waste liquor at the time of blowing, which material was published in PAPER TRADE JOURNAL October 7, 1926.

Soda Base

It is believed that this problem will find its final successful solution in the substitution of the calcium base for sodium in the cooking acid and increasing the concentration of the base and the organic matters in the liquor.

General Consideration

The interest in economy in the cooking process is evident from the wide application of the patented process for circulating the relief gases and liquors from digester to digester without cooling, resulting in a material steam saving. The packing of the chips in the digester by mechanical means or by steaming with its resultant economy in lime, sulphur and steam consumption and its increase in the output per digester is receiving considerable attention.

The utilization of the resinous woods for making sulphite pulp has been made possible by the modification of the process in line with the sodium sulphite processes.

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Strength Testing of Chemical Pulp

I. Relation Between the Initial Strength of Bleached Sulphite and the Strength Properties Developed in Beating It

By G. P. Genberg [1]

The object of this short paper is to give an illustration of the relation between the initial strength of bleached sulphite pulp, as determined according to the proposed standard method, and the strength properties developed in beating, as determined by the methods more generally used for testing pulp for strength.

Strength is a relative term and with the knowledge the paper maker now has of his raw materials, can only be defined when we know what characteristics are desired in a certain pulp and what properties the pulp is expected to give to the finished product. Pulp is converted into paper under so many different conditions and receives so many different kinds and degrees of treatment in different paper mills that it is almost necessary to know more about the physical properties of the pulp than merely its resistance to bursting after a certain length of beating, which until now has been almost the only property determined by producer and consumer of pulp. Most paper manufacturers today can specify what properties they desire in the pulp which is going to be used, and in most cases there are many other physical qualities demanded besides the resistance to bursting. Only a few years ago a manufacturer of glassine paper wanted a slowly hydrating sulphite that could stand considerable beating while the book paper manufacturer wanted a soft sulphite. Today, with the developments taking place in paper making and the economy exercised in modern mills, entirely different qualities are desired in sulphite for the two grades referred to. In fact, the requirements are today reversed for the two grades. With the trend towards power saving equipment, rapid hydration qualities are much in demand. A pulp that will develop high strength in a short beating time without being brittle is preferred to one requiring a longer beating time even if the maximum strength is higher.

Uniform Freeness Important

A uniform freeness of the stock going to the paper machine is one of the most important factors where uniform operation and quality of product are desired. To obtain a uniform freeness with standardized beater room operation it is necessary to have a pulp of known and uniform hydration properties. The resistance of a pulp to tearing and folding and its bulk are only a few other physical characteristics specified for pulp.

Sulphite pulp used for newsprint and in some grades of book paper and light wrappers, is not beaten in the true sense of the word as used in connection with bond and glassine papers. The beating is done in the jordans ad the properties required in pulp for these grades are different from sulphite which undergoes treatment in hollanders. Qualities desired for sulphite to be mixed with slower and shorter raw materials such as groundwood for newsprint, old paper stock and soda pulp for book paper, are principally fiber length, freeness and tearing resistance.

Consideration of the qualities required in an ideal pulp and the methods and conditions under which such a pulp can be produced are outside of the scope of this article, but in my opinion an ideal sulphite has such properties that it will reach a high maximum Mullen test in a relatively short beating time, at the same time possessing a high tearing test and flexibility. Such a pulp can be used for any purpose. An ideal pulp should also maintain a high Mullen during beating without any appreciable loss in the tearing test. Such properties are, however, unusual in commercial pulps. Pulps are produced of high Mullen test coupled with easily hydrating properties, but at a sacrifice of the tear. Pulps are also made so that they possess a high tear and freeness. Such pulps, however, generally require long beating time to reach a high Mullen and good felting qualities.

For the determination of strength properties of raw materials for a paper for which the pulp is not beaten to a large extent, the proposed method for determining the strength in unbeaten condition is of particular interest. It is not only for such purposes, however, that this strength test gives valuable information, but it also gives, in most cases, a distinct indication of the strength and hydration properties that can be expected of the pulp, if it is beaten. The test of the strength unbeaten gives information of the initial hydration and strength properties of the pulp. If a pulp is partly hydrated in unbeaten state, it can be anticipated that it will show easily hydrating properties upon beating. If a pulp has a high initial resistance to bursting and tearing, it can be expected that it will show an increase of these qualities after beating, provided the beating operations are carried out the same in every case.

Statements have been made to the effect that there is no relation between the strength properties of a pulp before and after beating. After a long experience with the unbeaten strength testing method in conjunction with a beating method applied to bleached sulphite, I am of the opinion that there is in most cases a very distinct relation, at least for this kind of pulp.

Study of Different Grades of Pulp

In order to illustrate the relation this study has been made, in which a number of different grades of bleached sulphite have been tested in unbeaten and beaten state. The samples represent the more important grades of bleached sulphite on the market. The location where these grades are manufactured and the kinds of wood used in their preparation are extremely varied.

Initial Moisture

In order to eliminate the effect of the initial moisture in the pulp at the time of testing, all samples were allowed to air dry before being tested. The effect of the initial moisture on the ultimate results, when testing sheets made from unbeaten sulphite, is considerably more pronounced than when the stock is beaten. This condition has received considerable attention in strength testing work and is so well known that any reference does not need to be made here.

The effect of the moisture in the pulp at the time of disintegrating the sample for the unbeaten strength test is so great that if a comparison is to be made of two grades of pulp, on the basis of this test, as to fiber strength, it is necessary to reduce the samples to the same moisture content before testing. This effect is illustrated by the following averages of a large number of determinations of the same stock in slush and machine dried condition.

	Mullen points/lb.	Tear g.
Slush	98.7	139.7
Machine dried (Average 88% air dry)	64.0	186.2

The following tabulation of unbeaten strength tests of samples, taken at different places on a drying machine, gives an excellent illustration of the effect of the initial moisture on the test.

Effect of the Degree of Drying on Strength Tests

Sample	Air Dry %	Mullen pts./lb.	Tear g.
At wet end	42.5	97	124
after 6 driers	47.1	90	135
12	51.3	89	140
18	58.1	83	142
24	65.7	74	149
30	73.4	60	143
36	80.2	61	154
42	89.1	55	165
47	91.4	63	159
Oven Dried	111.1	28	176

[1] Member TAPPI; Chief Chemist, Fraser Companies, Ltd., Edmundston, N. B.

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Methods of Testing

The methods used for testing the physical properties in this study are:

1. The unbeaten method as proposed by the Committee on Sulphite Pulp.

2. A modification of the original TAPPI method[1], by which the pulp is beaten for a certain length of time in a ball mill and then made into sheets.

3. A modification of the beating test suggested by Miller[2] at the 1926 Annual Meeting of TAPPI, by which the pulp is beaten in a ball mill and a sample of the beaten pulp, sufficiently large to make one test sheet, is withdrawn from the mill at regular time intervals.

The modification of the original TAPPI method consists principally in the use of a hydraulic press and a sheet machine for making the test sheets. The drying of the test sheets is made under tension[3] by allowing the test sheets to dry between the blotting papers used for pressing the sheets. The results are expressed in points per pound basis weight instead of on the basis prescribed in the original method.

Miller's method has been used only to the extent of the proportion of pulp and water in the mill and the particular way of sampling the ball mill. The sheet making, pressing, drying and testing have been done as in the modified TAPPI method.

In developing these methods, published and unpublished work by such investigators as O'Connor, Miller, Cameron, Wilen, Bates and others have been frequently referred to and a vast amount of valuable information has been accumulated and made use of through private communications with some of these investigators.

The details of the tests as applied to this investigation are as follows:

1. UNBEATEN STRENGTH

Disintegration

Seventy-five grams of air dried pulp are disintegratd in a pail of water by means of a Lightning mixer, Model C. To prevent swirling, two stationary wooden arms are placed half way between the wall of the pail and the propeller axle.

Preparation of Disintegrated Pulp

The pulp is diluted in a vat to 20 liters.

Sheet Making

The Date sheet machine with a mold 8 x 8 inches was used. The screen is covered with clear water to a depth of 4 inches. Two thousand cubic centimeters of the diluted stock—7.5 grams air dry pulp—are poured into the deckle box which is then filled with water of 20 degrees C. to such a height that it will require 12 to 14 seconds to form the sheet. The suspension of fiber is mixed by hand and no time is allowed for the fibers to settle but the gate valve is opened immediately on withdrawing the hand. The sheet is couched off on a piece of felt by means of a wooden rocker. The sheet is placed on another piece of felt. Four sheets are made, each placed between felts. Galvanized iron plates are placed on top and bottom of the stack.

Pressing

The hand sheets are pressed in a hydraulic press to approximately 80 per cent air dry in the following manner:

The wet sheets are first pressed for 30 seconds at about 40 pounds per square inch sheet area.

The sheets are then removed and are pressed between dry, cool blotters, eight blotters for each sheet. The pressure is raised to 200 pounds per square inch sheet area and is allowed to remain for 5 minutes exactly. The sheets are then replaced on dry blotters, four for each, and again pressed, raising the pressure to 200 pounds per square inch sheet area and leaving for 2 minutes.

[1] Report Committee Standard Methods of Testing Materials, 1917; PAPER, Vol. 19, No. 19, p. 11.
[2] Technical Association Papers IX (1926), p. 131.
[3] Technical Association Papers VIII (1925), p. 43.

Drying

The sheets are then placed in a humidity room where they are dried, weighed and tested at 70 degrees F. and 65 per cent relative humidity.

Preparation of Hand Sheets for Testing

The four sheets are weighed on a sensitive balance and the weight is expressed in grams. A strip 3x8 inches is cut from the four sheets for the tearing test, the remainder being used for the Mullen test.

Testing

Mullen. Each sheet is popped five times. The average of all (twenty) tests is determined.

$$\frac{\text{Average Mullen} \times 100}{\text{Weight of 4 sheets in grams} \times 4.09} = \%\ \text{Points per pound (basis 25x38:500)}$$

Tear. The four strips 3x8 inches are cut to standard width and are torn on an Elmendorf tester according to prescribed method. The sum of four tears on four sheets is determined.

$$\frac{\text{Elmendorf} \times 100}{\text{Weight of 4 sheets in grams} \times 4.09} = \%\ \text{Points per pound (basis 25x38:500)}$$

2. BEATEN STRENGTH

Preparation of Samples

One hundred grams air dried pulp are cut from the sample, representative of the pulp to be tested, and are soaked in 2,000 cc. of water and hand kneaded until well disintegrated. The temperature of the stock and water is regulated to 20 degrees C.

Beating

Abbe ball mills are used with jars 11⅛x13⅝ inches, revolving at a speed of fifty-six revolutions per minute. The charge of pebbles for each jar is 1,780 cc.

Charging the Ball Mill

The kneaded pulp, diluted in 2,000 cc. water, is poured into the jar together with the pebble charge.

Beating Time

The beating is carried out for 60 minutes.

Preparation of Beaten Pulp

Each ball mill charged is dumped in a pail, and the fibers are separated from the pebbles by washing over a coarse screen. The pulp is then diluted to 7,200 cc. and run into a disintegrator for 15 minutes. The pulp is then diluted in a vat to 20 liters. The temperature of the diluted stock is adjusted to 20 degrees C.

Sheet Making

The Date sheet machine with a mold 8x8 inches is used. The screen is covered to a depth of at least 4 inches with clear water. One thousand cubic centimeters of the diluted pulp (=5.0 grams) are poured into the deckle box which is then filled with water of 20 degrees C., to such a height that it will require 12 to 14 seconds to form the sheet. The suspension of fibers is mixed by hand and no time is allowed for the fibers to settle, but the gate valve is opened immediately on withdrawing the hand. The sheet is couched off on a sheet of dry blotting paper with a wooden rocker covered with napless felt. The sheet is placed on another sheet of dry blotting paper. Four sheets are made, each placed between blotting paper. Pieces of felts are placed between the sections of blotting and pieces of galvanized iron plates and placed on top and bottom of the stack.

Pressing

The sheets are pressed in a hydraulic press at a pressure of 200 pounds per square inch heet area for 2 minutes.

Drying

The hand sheets are dried between the sheets of blotting paper in an enclosed drying rack equipped with a hot air blower. The temperature in the rack is about 35 degrees C. After drying, the hand sheets are placed in the humidity room for seasoning, at

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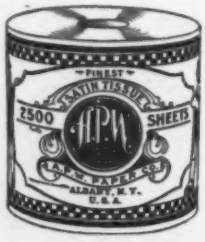

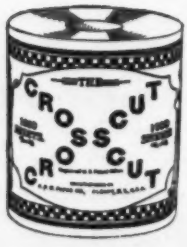

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least two hours before testing. The weighing and testing of the hand sheets are done at 70 degrees F., and 65 per cent relative humidity.

Preparation of Hand Sheets

The four hand sheets are weighed. The weight is expressed in grams. A strip 3x8 inches is cut from the four sheets for the tearing test and the remainder is used for the Mullen test.

Testing

Mullen. Each sheet is popped five times. The average of all (twenty) tests is determined.

$$\frac{\text{Average Mullen} \times 100}{\text{Weight of 4 sheets} \times 4.09} = \text{\% Points per pound (basis 25x38:500)}$$

Tear. The four strips 3x8 inches are cut to standard width and are torn on an Elmendorf tester according to prescribed method. The sum of four tears on four sheets is determined.

$$\frac{\text{Elmendorf} \times 100}{\text{Weight of 4 sheets} \times 4.09} = \text{\% Points per pound (basis 25x38:500)}$$

Freeness Test

The Forest Products Laboratories' (of Canada) standard freeness tester is used and the test is carried out with 800 cc. of stock of 0.5 per cent consistency at 20 degrees C. The diluted stock is poured into the freeness tester, the lid put in place, the bottom clasp is sprung and the pet cock opened. The overflow is collected in a graduated cylinder. The number of cubic centimeters overflow divided by eight is the per cent freeness.

3. BEATING TEST

Preparation of Sample, Beating Equipment and Charging the Ball Mill

One hundred grams of air dried pulp are soaked in 3,000 cc. water and are hand kneaded until well disintegrated. The temperature of the stock and water is adjusted to 20 degrees C. The same beating engine and pebble charge as described in the method for determining the beaten strength are used.

Sampling the Beaten Pulp

The ball mill is stopped every 20 minutes of beating time and a sample is collected as follows:

The mill is tipped slightly and the stock is made to separate from the pebbles by stirring the contents of the mill with the hand. One hundred fifty cubic centimeters (or 5.0 grams air dry stock are dipped out with a graduated cylinder cut at the 150 cc. mark. The sample is diluted to 500 cc. in a flask and is shaken vigorously to break up fiber bundles. Four hundred cc. are measured out and used for the freeness test. (See Freeness Test, following.) The fibers retained in the freeness tester together with the 100 cc. left, are used for making one test sheet.

Sheet Making, Pressing and Drying

These operations are carried out in exact accordance with the specifications made for beaten strength.

Preparation of Hand Sheet

Each sheet made from the samples collected at 20 minute beating intervals, is seasoned at 65 per cent relative humidity at 70 degrees F., for two hours. Each is then weighed individually and a strip 3x8 inches is cut for the tearing test and the remainder is used for the Mullen test.

Testing

Mullen. Each sheet is popped five times. The average of the five tests is determined.

$$\frac{\text{Average Mullen} \times 100}{\text{Weight of sheet in grams} \times 4 \times 4.09} = \text{\% Points per pound (basis 25x38:500)}$$

Tear. The strip cut for the tear test is folded twice and the edges cut off so that four small sheets are obtained. These sheets are cut to standard width and are torn once according to prescribed method.

$$\frac{\text{Elmendorf} \times 4}{\text{Weight of sheet in grams} \times 4 \times 4.09} = \text{\% Points per pound (basis 25x38:500)}$$

Freeness

The 400 cc. of the sample diluted to 500 cc. (4.0 grams air dry stock) are diluted to 800 cc with water of such temperature that 20 degrees C. is obtained. The freeness test is then carried out as described under beaten strength.

Results of the Strength Tests

If we analyze the results obtained we find that there is a certain relation between the Mullen and tear in unbeaten state, the

1		2			3																		
	Unbeaten Strength		Beaten Strength			Beating Test (Beaten different length of time (min.) in ball mill)																	
						Mullen						Tear						Freeness					
Sample No.	Mullen	Tear	Mullen	Tear	Freeness	20	40	60	80	100	120	20	40	60	80	100	120	20	40	60	80	100	120	Sample No.
1	20	223	53	154	35.0	15	32	44	52	60	65	223	182	177	149	131	136	59.7	51.5	35.7	28.4	21.4	14.3	1
2	47	241	101	142	28.2	62	83	94	102	104	108	238	187	165	146	146	146	62.5	45.6	36.6	25.0	16.2	12.0	2
3	74	187	96	109	14.3	62	69	88	83	85	75	152	133	125	119	116	91	43.7	33.1	25.0	16.0	10.5	6.0	3
4	59	204	96	119	28.4	57	73	90	88	83	86	146	129	104	107	105	82	54.1	41.7	31.1	20.6	14.4	7.5	4
5	49	206	91	109	25.6	53	78	89	90	95	95	154	113	107	92	87	80	51.7	44.3	31.2	23.6	11.2	6.3	5
6	43	205	81	105	22.4	49	70	79	79	67	71	155	123	100	91	100	94	54.0	43.1	28.1	19.3	10.5	5.0	6
7	57	208	87	130	26.2	52	73	86	95	87	90	180	158	128	120	116	101	54.7	43.5	34.5	24.5	13.4	8.2	7
8	54	213	83	132	35.0	54	72	86	93	88	87	186	149	147	147	129	120	57.4	46.3	35.5	25.6	16.5	9.3	8
9	36	118	..	....	....	45	58	60	58	..	..	115	82	57	55	....	....	45.6	20.3	8.6	1.4	....	....	9
10	62	196	94	121	25.4	63	77	87	89	79	80	164	137	127	127	116	101	53.7	42.2	30.0	20.6	12.3	8.7	10
11	50	194	88	99	28.1	53	76	89	87	80	79	148	134	97	93	101	90	55.6	46.2	32.0	21.2	13.2	7.2	11
12	49	217	94	138	33.6	57	77	95	98	98	90	256	142	139	139	116	116	57.5	47.0	33.4	24.7	18.0	9.2	12
13	41	141	70	62	9.3	40	56	54	42	42	36	120	80	67	65	57	36	55.5	37.5	21.4	12.0	6.1	2.0	13
14	62	190	94	128	29.3	68	85	100	89	84	92	156	150	145	122	122	112	54.3	47.0	39.2	25.6	18.6	12.3	14

hydration qualities and the strength qualities after beating. Take for instance samples 6 and 13, both having practically the same Mullen in unbeaten state but sample 6 shows a considerably higher Mullen in the beaten test than sample 13. If we look at the tear values of these two pulps we find that sample 6 is of higher tear than sample 13. The former sample withstood the beating better than sample 13 with the low tear, which is shown by the freeness test.

Another similar comparison may be made between samples 11 and 12. We find here a slightly higher unbeaten Mullen for sample 11, but after beating sample 12 is higher. We have here again a higher tear and higher freeness after beating for sample 12 with the lower initial Mullen but higher initial tear.

A very interesting example is sample 1, which has a very low Mullen but a high tear unbeaten. The sample is very slow hydrating and maintains a high freeness and tear during beating, with a continuous slow rise in Mullen. Sample 9 has also a very low Mullen, but higher than sample 1, but also a low tear. This sample hydrated very rapidly and reached a lower maximum than sample 1 with a complete loss of tearing qualities. Sample 13 is another sample of both low initial Mullen and tear which shows easy hydrating properties without strength after beating.

Sample 2, on the other hand, has only a fairly high Mullen but an exceptionally high tear in unbeaten state. This sample is quite easy hydrating and reaches a high Mullen maintaining at the same time a high tear during beating.

Sample 3 shows a high Mullen and only a fair tear unbeaten. This sample hydrated quite readily, reached a good Mullen in a short time, but maintained only a fair tearing test.

The relation between initial strength on one hand and hydrat-

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ing properties on the other is shown very well in samples 7 and 8. Sample 7 has a slightly higher Mullen but a little lower tear than 8. After beating a certain length of time the same relation exists between the two samples and sample 8 having the higher unbeaten tear has the higher freeness after beating. The beating test shows also that sample 8 is the freer of the two pulps and that the tear maintains a higher value during the beating compared with sample 7.

It must be remembered that the samples studied are of different makes, made from different species under very varied cooking conditions. Slight irregularities in the results must therefore be expected. The results show conclusively, however, that by knowing the initial strength of a bleached sulphite it is possible to predict the qualities that will be obtained after beating.

Conclusion

As general conclusion from the foregoing tests, it may be said that:

1. A low initial Mullen and low tear indicate an easy hydrating pulp of low strength.
2. A low initial Mullen and high tear indicate a free pulp requiring long beating to reach a maximum Mullen value. Such a pulp will maintain a high tear during beating.
3. A high initial Mullen and low tear indicate a pulp already hydrated to some extent. Such a pulp will reach a fair maximum Mullen in a short beating time. The freeness and tear will run low during beating.
4. A high initial Mullen and high tear will result in a high strength after beating, coupled with easy hydrating properties.

II Strength Testing of Pulp

By Howard W. Laymon*

When one begins to study the strength of papermaking fibers, he is soon brought face to face with a great many factors which influence results obtained in attempts to determine and establish a practical measure of this strength.

It is a well known fact that beating will change the strength of pulps and the work done by ball mill methods is perhaps familiar enough to most technical men in the paper industry to need no further comment here. The tendency in many mills now is to use pulp with a minimum of beating. In this case the strength of pulp as used, is of more value to the paper maker than the strength which *might* be developed by beating in a beater or in a pebble mill. This has led to a great amount of work in an effort to find a reliable method of determining this strength.

In the writer's experience, the method being proposed by the Sulphite Pulp Committee as a standard method, has proved to be the most satisfactory. While it is by no means perfect, and will be improved from time to time, it has given startlingly good results in actual mill operation.

In order to have it fresh in mind the method is as follows:—

Proposed Standard Test Conditions for Determining the Initial Strength of Pulp

1. Disintegration

The pulp sample to be tested shall be in a perfect state of disintegration, this having been accomplished in such a manner that no hydration or cutting of the fibers has taken place.

2. Preparation of Disintegrated Pulp

The pulp shall be diluted to 0.5 per cent consistency. The exact consistency must be determined in each case, so that the exact amount of fibers can be measured out for the test sheets.

3. Area of Test Sheets

The area of the test sheets shall not be less than 36 square inches and not more than 81 square inches.

4. Weight of Test Sheets

The test sheet shall have a weight equivalent to 125 lbs. per ream, 500 sheets 25x40 inches, and must not vary in weight more than + or — 3 pounds on this basis.

5. Sheet Making

The test sheets shall be made on a sheet machine. The screen shall be covered to a depth of about 4 inches with clear water. The volume of diluted stock corresponding to the quantity of fibers required to make a sheet of above described weight is poured in and the deckle box is filled with clear water to such a height that it will require 12 to 14 seconds from the time the discharge valve is opened until the water has left the sheet completely.

The sheet shall be made as follows:—The suspension of fibers is mixed by hand and no time is allowed for settling, but the discharge valve, which must be a quick opening valve, is opened immediately on withdrawing the hand. The sheet shall be couched off on a damp felt and placed on another felt. Each sheet shall be placed evenly on the felt covering the previously made sheet and pieces of galvanized iron plates shall be placed on top and bottom of the stack.

A sufficient number of test sheets shall be made, so that a sufficient number of determinations can be made to insure an accurate average of each strength property desired.

6. Pressing.

The sheets shall be pressed between the felts for 30 seconds at about 40 pounds per square inch sheet area.

The sheet shall then be removed and be pressed between dry and cool blotters. Eight blotters shall be used for each test sheet. The pressure shall be raised to 200 pounds per square inch sheet area and allowed to remain for 5 minutes exactly. The test sheets shall then be replaced on dry blotters, four for each sheet and again pressed, raising the pressure to 200 pounds per square inch sheet area and leaving for two minutes.

7. Drying.

The pressed sheets shall be dried at 65 per cent rel. humidity and 70 degrees F. temperature

8. Weighing of Test Sheets.

The sheets shall be weighed on a scale having a sensitivity of 10 mgr. per 50 grams. The weight shall be expressed in grams and hundreds of grams and then recalculated in pounds per ream.

9. Testing of Sheets

The sheets shall be weighed on a scale having a sensitivity of 65 per cent relative humidity and 70 degrees F. temperature on apparatus recognized as standards.

10. Computation of Results

All tests shall be reported in per cent points per pound base weight. The basis for the weight used for calculating the results must be stated with each report.

Different Steps of the Method

In support of this method some figures and observations based upon experimental results are here being presented. To more clearly present them, let us follow in general the different steps of the method as it is outlined.

(1) Disintegration.

We have found that an electric stirrer similar in style to a soda fountain drink mixer is very efficient and satisfactory. The apparatus of course is much larger, having a ¼ horse power motor direct-connected to the agitator shaft, and has a speed of

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125 r.p.m. The blades of the impeller or agitator are adjusted so that they will violently agitate 7½ liters of a 1 per cent stock in a ten quart pail without forcing the pulp over the side of the vessel. The rate of hydration or cutting is so slow with this type of apparatus that a time limit may be set for a given type of pulp which will insure complete disintegration or separation of the fibers and at the same time not produce an appreciable hydration.

It is fairly easy to determine when complete disintegration has been accomplished by stirring a small portion of the pulp in a beaker or glass of water and inspecting for bundles of fibers.

(2) Preparation of Disintegrated Pulp

When one is measuring only a few grams of pulp in suspension (slush form), the stock must be quite dilute, otherwise the bunching or clinging together of fibers will preclude accurate measurement. In this case it is essential that it is possible to take very nearly the same amount of pulp at each measurement, so that each of the test sheets will be of the same weight. Consistency tests may be made in any correct manner suitable to the desire or convenience of the one making the experiment.

(3) Area of Test Sheets

Since both tearing and bursting tests should be made upon the sheets, they must be of sufficient area to make an adequate sample. An 8x8 or 7x9 inch sheet has been found quite satisfactory.

(4) Weight of Test Sheets

The weight selected (125 pound sheet—Basis 25x40-500) is appropriate because it produces a sheet easy to make and to handle. Also in testing, sheets of this weight made of the ordinary pulps give readings which come in the proper range for the indicator scales of the usual testing instruments.

It is not possible to make sheets exactly the intended weight each time and, of course, correction must be made for the variation in weight. The test results are not exactly proportionate to the weight of the sheet. As the weight increases, the strength test increases faster than a direct ratio. An average of results of three series of tests made upon bleached sulphite sheets (varying in weight from 60 to 180 pound basis) indicate a strength change for Elmendorf test of 0.8 per cent for each gram variation on the weight of four sheets 7x9 inches (0.2 per cent per pound basis weight). The Mullen change was 0.5 per cent for each gram (0.12 per cent per pound basis weight). This is not a very large error and if the weights are within the tolerance allowed it may be neglected. Results by another laboratory gained by a similar experiment, however, have shown much larger differences than these, resulting from variations in the weight of test sheets. The difference found was in the same direction. That is, the test points per pound increased as the weight of the sheet increased. Cameron (See Pulp & Paper Magazine—Feb. 1, 1923—Page 131 a) by a somewhat similar procedure obtained results opposite to these. His results show a *decrease* in points per pound as the weight of sheets increased.

This indicates that the weight is important and care must be taken to make the sheets as near the correct weight as possible, although our results indicate that the specification of plus or minus 3 pounds basis is much more rigid than necessary. The weight tolerance could be determined by the laboratory using the method and under their operating conditions, if necessary. Boys with only high school training have been easily taught to make test sheets which are sufficiently uniform in weight.

(5) Sheet Making

The operation of making the sheet for testing is a very important one, and must be performed quite carefully and under the proper conditions. Success or failure of the method depends upon how uniformly the sheets are made.

It has been found that a considerable quantity of water must be used in the making of a sheet of long free pulp, such as new sulphite. If too little water is used and the time of formation is not long enough, the sheet will be wild and the test results erratic. The most practical time of formation has been found to be 12 to 14 seconds. The amount of water required to obtain this time varies with the type of sheet machine used. If the sheet machine has no suction, and the water drains through the mold or wire by gravity alone, the depth of the stock above the wire diluted to the proper amount will be about seven inches. If the sheet machine is equipped with a water-leg to produce suction, the depth of stock, or in other words, the amount of water added will be somewhat different, depending upon the length of the water-leg and the size of the discharge orifice. If a water-leg is used it is essential that its capacity and the rate of discharge be adjusted so that there will be a continuous suction during the entire time of formation of the sheet. The writer had some experience with one from which the suction water all drained before the excess of water was removed from the stock forming the sheet. This meant that there was suction only during part of the time of formation. When the water drained from the water-leg the suction was broken and the remainder of the water drained out of the sheet by gravity. With this arrangement, the time of formation was very irregular and the test results very erratic. The discharge orifice was reduced to a point at which this did not happen and regular times of formation and consistent test results could be obtained.

In order to show how uniform is the time of formation when proper adjustments are made upon the sheet machine, the following figures are given. Four sheets each of four different representative pulps were made and the time required for the water to leave the sheets observed by the aid of a stop-watch. The sheets were 7x9 inches and when dry weighed 7.5 grams each. The depth of water above the wire in each case was 19 inches. Figures in the body of the table are seconds required to form the sheet. Results are tabulated as follows:—

Sheet number	1	2	3	4	Average
Bleached soda pulp	13.0	13.2	12.8	13.4	13.1
Weak bleached sulphite	12.4	13.2	12.0	13.2	12.7
Strong bleached sulphite	13.0	13.6	13.6	13.4	13.4
Unbleached sulphite	13.0	12.8	12.0	12.4	12.5

(6) Pressing

The first pressing of sheets between felts at low pressures serves chiefly to remove the water from them. The exact pressure used at this point is not very important. A considerable vestigation of this point was made. Four sets of four sheets if the rest of the operations are carried out properly. An investigation of this point was made. Four sets of four sheets each were made and pressed at 20 pounds per square inch of sheet area. Four corresponding sets were made and pressed at 60 pounds per square inch of sheet area. The average results are as follows:—

	Elmendorf Test	Mullen Test	
20 lb. pressure	210.5	34.1	per cent points per pound basis weight
60 lb. pressure	212.0	35.1	per cent points per pound

These are very good check results, showing that within these limits at least, pressure is not an important factor. This is very fortunate since pressure guages suitable for the higher pressures may not be accurate enough to differentiate between a few pounds per square inch at low pressures.

The higher pressures which are the final ones must be watched more closely. Work done by our own laboratory and by other investigators shows a strength vs. pressure curve, which rises rapidly to a point short of 200 pounds per square inch of sheet area. The curve then flattens out with a much more gradual slope. The pressure of 200 pounds was selected because the information available indicated that in most cases this would give a result which did not fall upon the steep part of the curve. This means that unavoidable pressure variations would not produce a serious error at this point. Pressures of 400 pounds or over would probably reduce this error somewhat, but they are rather difficult to use, without a rather elaborate and expensive press.

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TISSUE PAPERS

The condition of blotters used in pressing the sheets must be given a reasonable amount of care to keep them clean, smooth and absorbent. The temperature of the blotters has a very distinct bearing upon the test results. That is the reason why the method specifies dry, *cool* blotters.

Four sets of comparisons were made and the following are average figures:—

	Elmendorf	Mullen
Cold blotters (room temperature)	234	31.5
Hot blotters (just from drying oven at 150°F.)	219	30.7

(Four sheet were made for each test. Four comparisons is therefore a total of 32 sheets.)

It will be noted that the difference is found largely in the Elmendorf test. There is a small but consistent difference in the Mullen test.

The temperature factor is easily controlled. It simply means that the blotters must be removed from the oven and allowed to remain long enough to adjust themselves to room temperature before using.

As may be inferred from above, the blotters may be dried and used over again. Just how many times they may be re-used without altering results we have not attempted experimentally to determine. Presumably that would depend upon the nature of the blotters, the character of pulp used, cleanliness of surroundings, temperature of drying oven, etc. It is well known that paper fiber soon oxidizes and becomes hard and brittle from continued exposure to temperatures of 100 degrees C. and over, so it is best to dry blotters in an oven maintained at a lower temperature.

(7) Drying

There has been somewhat of a controversy as to the proper method of drying test sheets. The chief point of contention is whether drying in an oven will injure the sheet for testing.

Judging from experience and from the reports of other laboratories, the time the sheets are left in an oven is a very important factor. When sheets are made according to the above method, soda pulp will contain more moisture than sulphite. One laboratory reports that sulphite sheets could be dried in an oven at 100 degrees C. for 5 minutes without decreasing strength, and that soda sheets could be dried for ten minutes without decreasing strength. There is no question but that prolonged drying at 100 degrees C. will diminish the strength of fiber.

The writer has compared the strength of sheets dried in the atmosphere of the laboratory with those dried in a current of warm air in a partially closed case at an average temperature of 50 degrees C. for 15 minutes and found no appreciable difference in strength.

The most satisfactory, safest and easiest way we have found to dry sheets is to hang them in the humidity room immediately after pressing. They will dry to constant weight in an atmosphere of 50 per cent relative humidity and 70 degrees F. in 45 minutes. A little longer than this might be required in an atmosphere of 65 per cent relative humidity.

This brings us to the question of the proper humidity. Since this was quite thoroughly argued by the Technical Association and a standard of 65 per cent relative humidity was adopted for paper testing, it is logical to adopt that as a standard for pulp testing.

The average of four sets of comparisons of bleached sulphite at 50 per cent and 65 per cent relative humidity made in our laboratory showed 4 per cent higher Elmendorf test at 65 per cent than at 50 per cent relative humidity and 14 per cent lower Mullen test at 65 per cent than at 50 per cent. The average of six comparisons of soda pulp gave practically the same results. The increases and decreases were 4 and 13 respectively instead of 4 and 14 as for sulphite.

(8) Weighing of Test Sheets

Where a constant humidity room is available and the scales are located in it, this does not of itself present a problem. It must be noted, however, whether the sheet shrinks on drying. Unbeaten pulps prepared in the manner prescribed seldom shrink on drying. Beaten or processed pulp sheets may shrink very materially. In that case it is necessary to measure them and calculate the basis weight accordingly. It may even be necessary to trim the sheets before measuring and weighing.

(9) Testing of Sheets

The atmospheric conditions of testing perhaps need no further comment.

The sheets should be tested by at least two methods. Bursting and tearing tests seem particularly suited. These two tests are valuable because they measure different qualities of the paper or pulp sheet. A long fibered sheet unbeaten usually has a high tear (Elmendorf) test and a relatively low bursting (Mullen) test. By beating or jordaning, this Mullen test may be increased, but at the same time the Elmendorf test is reduced. For this reason it is advisable to have both these tests when judging the strength of a pulp.

The writer regrets that facilities have not been available to obtain tensile strength results along with the bursting and tearing tests. Perhaps some one may have this information. At least it is a very interesting field for a lot of investigational work, and some expert mathematician may be able to establish a workable factor or formula of relation between the varying tests obtained by tensile, bursting and tearing testers.

When Mullen and Elmendorf tests are selected as the ones to be used, the following procedure has been found convenient and practical: Four sheets 7 x 9 or 8 x 8 inches of each sample are made and conditioned. The sheets are then stacked together and strips cut from each of two diagonally opposite corners, large enough for four tears on the Elmendorf tester. This makes a total of eight tests on four sheets. The four sheets are torn together. There is enough room left for four Mullen tests on each sheet. That makes a total of sixteen Mullen tests to be averaged for each sample of a pulp.

(10) Computation of Results

Test results expressed in terms of points per pound basis weight are more comprehensive and more easily understood than if expressed in some arbitrary manner. If expressed in straight points per pound the numerical result is a small number of a fraction. This has led to the use of "per cent" points per pound, which means that the decimal point is moved two places to the right and the result may be written as a whole number. Points per hundred pounds basis weight is another way of saying the same thing. The reason for occupying space with this explanation is that the writer has encountered some confusion as to just what "per cent points per pound" meant.

As different branches of the industry use different dimensions for determining basis weight, each one will probably insist on using the basis with which it is familiar.

Since there are so many types of papers and so many methods and degrees of treatment of the pulps used, each mill will have to interpret the test results to suit its own conditions of operation and the product desired.

It is quite probable that an intelligent use of bursting and tearing tests made by this method may prove a valuable aid in the control of digester operation. It seems quite feasible to produce a high tear and low Mullen test or a high Mullen and low tear test pulp by varying the cooking conditions.

Bleaching also affects these qualities of a pulp and over or under bleaching will give quite different results upon the same pulp.

This method of testing is applicable not only to sulphite pulp but to soda and other kinds of pulps and to beaten and refined paper stocks. It is recognized that this method is not perfect, and that there is room for improvement, but on the other hand, it is not just a fanciful idea. It has been successfully used in actual mill operation on a large scale.

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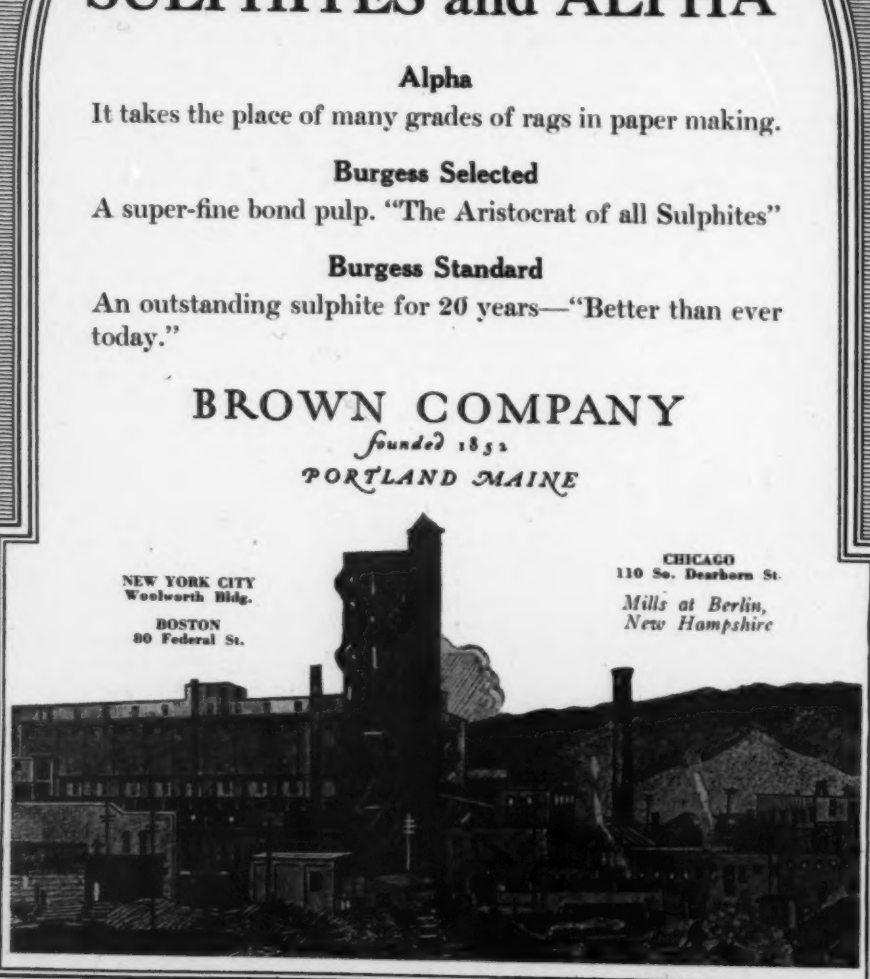

Report on Testing Freeness of Pulp

By Allen Abrams

For about a year the Mechanical Pulp Committee has been investigating the types of equipment now available for testing the freeness of pulp. As several instruments are now used and since no standard methods have been adopted it is difficult at this time to make intelligent comparison of freeness figures.

The following report describes briefly the kinds of equipment now in use and suggests a standard instrument and method for carrying out freeness determinations.

1. SCHOPPER-RIEGLER BEATING TESTER

In Wochenblatt for Papierfabrikation Sept. 27, 1913, appeared an article describing this "beating" tester. It consists of a chamber for holding the dilute pulp suspension, with a closing cone over the bottom; a perforated bottom to the chamber; and below the bottom a conical separating chamber provided with a large and a small discharge opening.

The test is made by pouring 1.00 liter of 0.20 per cent stock into the top chamber, lifting the closing cone and collecting separately the water from the two discharge openings. The cubic centimeters of "quickly drained" water from the large opening is subtracted from 1000 cc. and the remainder divided by 10 to secure the "beating degree" of the pulp.

This tester is sold for $250 by Foreign Paper Mills, Inc., 72 Duane Street, New York. The agents state that it has basic patents to protect it.

2. GREEN IMPROVED PAPER STUFF SLOWNESS TESTER

In Paper Feb. 23, 1916, A. B. Green describes his improved tester. This equipment comprises a cylindrical chamber having a perforated bottom covered in turn by a hinged, tight-fitting, solid bottom. The top lid of the chamber is tight-fitting, hinged and provided with a pet cock. The chamber is supported on brackets over a funnel provided with a bottom and side drain.

The operation consists in making up a 0.50 per cent suspension of stock; closing bottom lid tight; filling chamber with well stirred stock; closing upper lid with pet cock open; placing graduate underside outlet from funnel; swinging bottom lid out of way; opening pet cock; collecting all water discharge from side outlet of funnel. This amount in cc. gives the freeness of the stock.

Green claims an improved method of starting draining and the advantage of collecting water from the side outlet only. He secured U. S. patent on August 3, 1926. His equipment is sold for $100 by the Star Brass Manufacturing Company, Boston, Mass.

3. WILLIAMS UNIVERSAL MODEL 50-50 FREENESS TESTER

This tester comprises a receiving chamber for the pulp suspension, having a perforated bottom. This bottom is covered by a groundjoint foot valve which is operated by a T handle. Beneath the chamber is another funnel-shapped chamber having two vertical outlets at the bottom. One outlet leads to a waste-pipe while the other empties into a chamber provided with a float and pointer.

The operation consists in adding 500 cc. of 0.40 per cent stock to the receiving chamber; turning T handle to start discharge through perforated bottom; reading pointer on scale after it has come to a stop.

The advantages claimed for the tester are ready calibration with water, comparative scale readings and improved mechanical features.

The instrument is sold for $195 by the Williams Apparatus Company, Watertown, N. Y.

4. CANADIAN PULP & PAPER ASSOCIATION STANDARDIZED FREENESS TESTER.

Early in 1924 the Technical Section of the Canadian Pulp & Paper Association became dissatisfied with the status of freeness testing and appointed a committee to standardize the test. An abstract from their report states "The first active step taken by the Committee was the compilation of a thorough literature study of all the different designs of testers in use today. This compilation was reviewed by members of the committee and agreement was reached that the Green tester should be used as the basis of standardization. This decision was based on the knowledge that no other instrument represented sufficient advantages, either in accuracy of testing or ease of manipulation, sufficient to offset the advantage of standardizing an instrument with which the industry was already thoroughly familiar."

The committee abandoned as too difficult the idea of a theoretical study of primary principles to bring out a more scientifically correct tester. They adhered to the principle and general form of Green's apparatus, introducing only such modifications as would increase accuracy in manufacture and both ease and accuracy of manipulation.

A description of the tester would therefore read much like that of Green's except that it is to be noted that the Canadian equipment is rigidly supported, more substantially built, easier to calibrate and manipulate. The apparatus is made of cast brass, thus allowing of accurate machine work and exact duplication.

At present all instruments are calibrated by the Division of Pulp and Paper, Forest products Laboratories of Canada. To E. P. Cameron, Director of that Division, is due much of the credit for the production of this tester.

The Canadian committee proposes that the freeness test be made with stock of 0.30 per cent consistency and at 20° C. The operation consists in closing the bottom lid of the receiving chamber and opening the top; setting a graduate under the side discharge; adding 1.00 liter of 0.30 per cent stock, thoroughly mixed and broken up; then performing the following operations at such a rate that 5 seconds shall elapse from the end of the operation 1 until the beginning of operation 5.

1. Pour the diluted stock into the receiving chamber. (The five seconds start when pouring is finished.)
2. Secure the top lid with pet cock open.
3. Close the pet cock.
4. Release the bottom lid.
5. Open the pet cock and thus start drainage.

The total volume of water collected from the side outlet measures the freeness of the stock.

In order to allow of the test being made at consistencies between 0.20 and 0.40 per cent and at temperatures between 10° and 30° C. the Canadian committee has prepared two tables based on 1000 freeness determinations and 2000 calculations therefrom.

This instrument is supplied through the Forest Products Laboratories of Canada, Montreal. The price is $200 to which must be added $85 duty if ordered for delivery in United States.

Conclusions

After reviewing the present status of freeness testing your committee feels that the best interests of the pulp and paper industry will be served by adoption of a standard freeness tester and a standard method of performing the test.

Since our Canadian neighbors have performed such an excellent piece of work in perfecting their equipment, we believe that its manufacture and sale in this country as a standard tester will be of mutual benefit to the Canadian and United States industry. Negotiations with the Canadian committee and with A. B. Green indicate the willingness of the former to furnish all manufacturing and calibration details; of the latter to manufacture and sell this instrument in the United States at a price of $200 or possibly less.

All patent matters must be cleared up to avoid any possibility of infringement but this can probably be handled satisfactorily.

Having such a standardized instrument and exact details of manipulation it should be possible to discuss freeness in terms universally understood.

TAPPI SECTION, PAGE 110

A SIGNIFICANT FACT!

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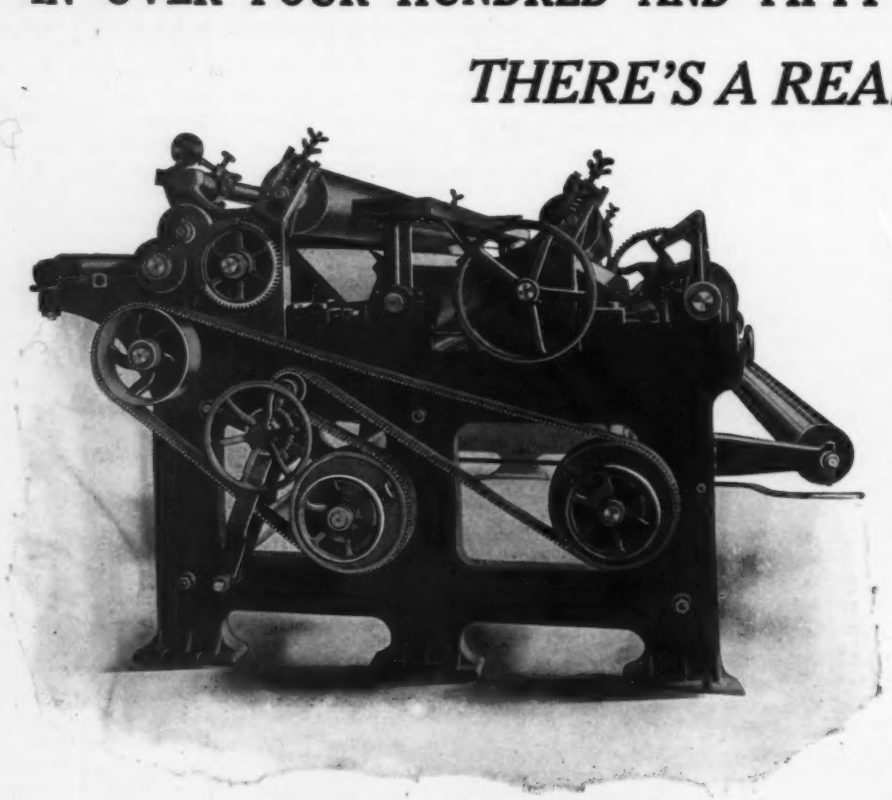

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Groundwood Control

By Ray J. Schadt [1]

The object of this paper is to show the relation that the power consumption per cord of wood ground has to the quality of the stock and how this ratio can be used as a control test. Before going into this subject it might be well to discuss some of the present methods of groundwood control.

The method probably used more extensively than any other is the freeness test. This gives the water retaining property of the stock. When this test is applied to the screened stock and to stock going to the paper machine, it gives good results. However, tests so made show the kind of stock that has just been produced and frequently the groundwood mill has to start immediately to make the stock for the next test period so as to correct this last. Probably the best place to make the test would be at the grinders, but it has been my experience that these tests are not accurate, due to shives in the stock, and also take too much time due to the fact that in most cases there are too many tests to be made. In the modern newsprint mill there are usually 15 to 20 grinders or more, either of the magazine or pocket type and if a test is to be made on each of them the results will be obtained too late to be of any real benefit. Other disadvantages are that due to poor agitation in the grinder it is not possible to get a representative sample of the stock being made at the time the sample is taken. In a mill using white water on the showers, the freeness can be very readily changed by making changes in the consistency of the grinder stock. Changes in temperatures likewise affect the freeness of the stock.

The blue glass has been found useful for checking individual grinder performance. It is very useful in locating the stones that are making shives and coarse fibers, and in ascertaining the general characteristics of the stock. This method is, however, wholly dependent upon the judgment of the individual using it. What might be good stock to one individual would not be to another, so the blue glass is not adequate either.

Knowledge for record purposes of the quality of the stock at each grinder is really the important part of groundwood control. It is thereby that the stone making inferior stock can be detected and the proper remedy applied, whereas in taking the stock average the freeness test might be correct, but the stock might still contain short shives that pass through the screens and show up in the sheet. There is a need for some method that will give the quality of stock that is coming from the grinder. The power used per cord of wood ground gives this information accurately enough that it may be used as a control test.

Coming back to the purpose of this paper, the relation of power consumed to the quality of stock, and how this figure can be used as a control test: going to the theoretical side of grinding, we have set down by the U. S. Department of Agriculture in Bulletin 343, several conclusions that were the result of experimental work done on wood grinding. This method is based on these conclusions, which I believe are familiar to all, the applicable ones being as follows:

1. The power consumption per ton of pulp and the power to the grinder vary inversely as the sharpness of the surface of the stone, other things being constant, i. e., speed, pressure, etc.

2. The production of pulp in bone dry tone per 24 hours increases directly with the sharpness of the stones and at practically the same rate for all grinder pressures.

3. The strength of the pulp made decreases with increase in sharpness of the stone. Following are the curves: (Fig. 1.)

In going over these curves it can be seen that the quality is largely dependent upon the power used to grind the wood. The power consumed varies in indirect ratio with the sharpness so that the power consumption per cord tells largely the quality of stock that is being made.

After all, the reduction of wood to pulp is a strictly mechanical operation. The wood is divided into small particles. The finer these particles the more power it is going to take to produce them. in other words, the slower the stock the more power required to produce it. This, of course, applies to a certain type of grinder using the same kind of wood; that is, comparisons must be made with the same types of grinders.

Instead of using ton as a unit, cords of wood can be substituted. Although this seems to be a preposterous assumption, it is nevertheless sufficiently accurate for use and this has been proven in actual practice. In one case the wood was measured every two hours by means of having it stacked in cord racks, partly used

[1] Junior Member, TAPPI; groundwood superintendent, Port Alfred Pulp & Paper Co., Ltd., Port Alfred, Que.

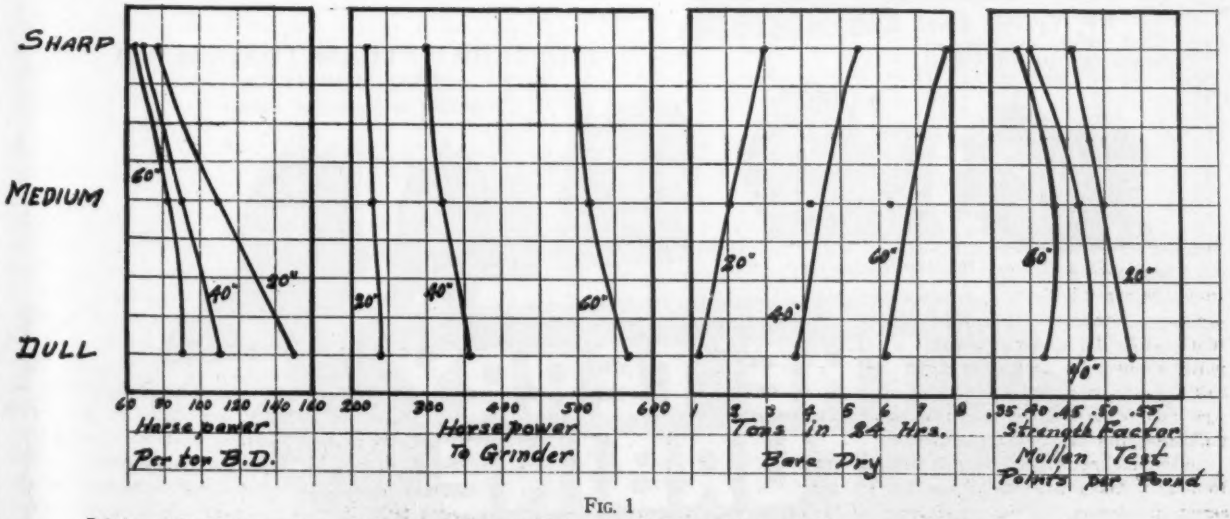

FIG. 1

Relation of Power Consumption, Production and Strength Factor with Sharpness of Stone at 225 r.p.m. and Various Cylinder Pressures.

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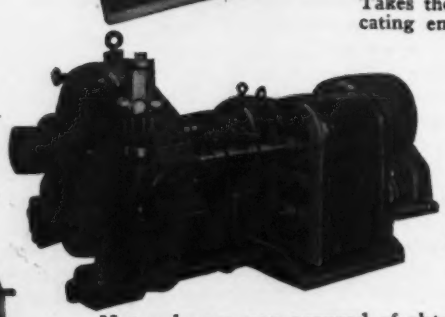

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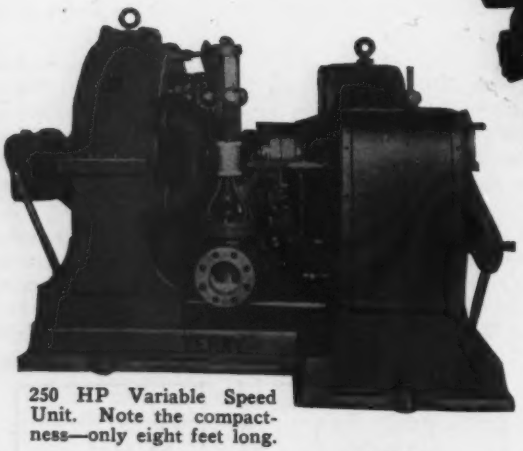

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cords being measured by a graduated stick. This method proved to be accurate to 5 per cent.

The magazine grinder lends itself particularly well to this method, as the wood is measured with an automatic instrument, as used, and with standardization it is possible to obtain a very accurate account of the wood cut.

The next requisite is the power consumed by the grinder which is obtained from a kilowatt hour meter. In this connection, grinders that are driven singly by motors give better data than when driven in pairs. In the latter case the power per cord obtained is an average for the two stones. By an inspection of the wood ground by each it can be ascertained which of the two stones is cutting better.

Some types of grinders have a recording load meter. Although this gives the power load the grinder is taking, it is not usually a sufficiently straight curve to be used directly. While the load meter can be used the kilowatt hour meter gives the power used more accurately.

Suppose this test is taken every two hours (it is important to have this time of the power measurement to within five minutes each period) on a grinder that is individually driven, the kilowatt hours registered were 1200 and 1.00 cord of wood was ground. The power used in this case included the motor loss. For very accurate work the motor loss should be subtracted, but as a grinder will be operating more or less at a constant load, this can be included with the actual power used for grinding. As the kilowatt hours for two hours exactly were 1200, then power would be

$$\frac{1200}{24} = 50 \text{ kw. days or } 50 \text{ kw. for } 1.00 \text{ cord or } 67.0 \text{ hp. per cord.}$$

This can be calculated for each grinder and an average arrived at and at the same time the total quantity of wood can be obtained. This gives a complete story of operation as obtained every two hours instead of every shift or every day.

A groundwood mill in using this system would soon find an average kilowatt—or horsepower—days per cord that would result in satisfactory pulp for the paper machines. By holding to this figure as closely as possible it will be found that uniform stock results. Besides this, these tests are used to advantage in telling the grinder room foreman the operation of his individual grinders in a minimum of time. By following the production and power per cord of each stone, it is possible to have a stone sharpened only when the power increases to a certain value and to dull only when the power reaches too low a value.

Not only does this method assist in making superior quality of groundwood but it sets a standard of power and production and it serves to give a continuous record of operations in the grinder room. It tends to prevent extremes in the dullness or sharpness of the stones and the result is more uniform groundwood.

Two curves of the operation of four grinders are shown (Fig. 2). One shows the freeness at approximately hour intervals, and the other kilowatt-days per cord consumption, obtained at two hour intervals. The figures have been reversed on the scale to show similar variation in both curves. It can be seen that the two curves follow each other fairly closely. In this connection it might be said that the figures in the power curve would be more representative of just what is happening than the freeness

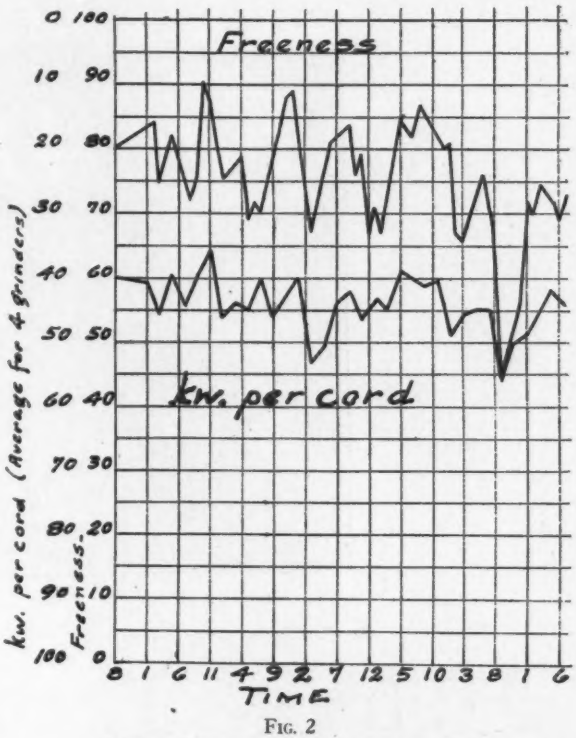

FIG. 2

Relation of Freeness to Average Power per Cord.

figures; for the former represents averages for every two hours while the latter is only specific samples taken at intervals.

While these curves indicate that there is a direct relationship between freeness and power consumed, the writer does not wish to be construed as meaning that the power-production method of control should replace freeness tests. The two control methods work nicely together, the real importance being that the grinder room be kept continuously informed as to the operation of each stone.

The power-production method of groundwood control has proved equally as satisfactory in the operation of a pocket grinder mill as it has in the magazine grinder mill.

Comparison of Grinders

By A. F. Meyer[1]

Although the data collected during the year by the writer as a member of the Groundwood Committee of which C. K. Andrews is chairman, did not cover as many mills as he had hoped, yet the effort and expense devoted to this work have not been in vain. Many of the mills manifested a keen interest in the work. Others, no doubt, will watch their operations more closely than heretofore, because the questions asked have been germane to the problem of economical production of groundwood.

The difficulty experienced in summarizing the data furnished has pointed the way to desirable modifications of the proposed code. We trust, also, that those who have used the code will offer constructive criticism.

It would appear to be worth while to follow up the work that has been begun so that ambiguities in data furnished may be cleared up, missing data supplied, and some general information pinned down to specific facts if possible. The word "normal" seems to have been very much misunderstood or misused in the replies received.

Unappreciated Waste

Many of the mills do not know how much is wasted in slivers and white water not utilized. Others operate on closed systems. Many mills regrind rejections from bull screen in regular or special grinder pockets. A surprisingly large difference appears in the diameter of pulpstones when discarded and in the stone life.

[1] Member TAPPI. Consulting Engineer, Minneapolis, Minn.

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Mill Number	Kind of Pulp Produced	Kind of Wood Used	Size of Wood	Burr Used: Summer	Burr Used: Winter	Temperature in Grinder Pit—° F.	Consistency in Grinder Pit—%	Yield of First-grade Pulp—lb./cd.	Yield of Second-grade Pulp—lb./cd.	Total Waste—Slivers and White Water—%	Type of Refiner Used	Type of Speed Regulator Used	Type of Load Regulator Used	Labor per Cord—Wood Handlers	Labor per Cord—Grindermen	Labor per Cord—Total	Stone Life—Cords	Maintenance Cost of Grinders	Peripheral Speed—f.p.m.	Unit Pressure	Unit Surface	Unit Capacity	Unit Power	Pressure-Speed Ratio	Wood Ground per Grinder Day—Cords
3H1 [4]	News & Manila ...	80% Spruce 15% Fir	70	10 thread	10 thread	212?	13½?	2300 2050 Spruce	Wrapper	None	None	Meyer	.....	$0.50	$0.60	$8.167	——	——	3120	32	42	8.21	14.3	97	10
3H2	Board	60% Spruce 40% Pine	Av. 3"	Special	Special	140	6	1950 Pine	None	56	None	Meyer	.....	0.45	0.90	1.394	4400	$0.10	3280	22	48	6.93	9.9	149	6½
3H3	News	40% Spruce 60% Hemlock	90	9x3	9x3	165	5	2447	None	12	Berkshire & Horne Beaters	Meyer	.....	0.976	1.627	3.307	990	0.46	3670 2820	31 & 25	44	10.0 & 6.2	——	118 & 112	——
3H4	News & Hanging..	60% Spruce 40% Balsam	90	Straight & fine Dia.		180	5	2250	None	30.3	None	Pump	.....	0.80	1.80	3.08	——	——	3040	33	36	7.2	14.9	99	——
3H5	Tissue ...	90% Spruce 10% Balsam	—	No. 7 Dia.	No. 7 Dia.	——	——	2100	——	——	None	None	.....	——	——	——	——	——	2050	39	39	6.2	20.8	53	——
3H6 [1]	News	45% Spruce 35% Hemlock 20% Balsam	80	85% 9x1½	15% No. 10 Dia.	180	6.5	3800	20	None	B'kshire	Meyer	.....	0.50	4.00	6.25	——	——	3400	33.5	44	10.1	10.0	101	——
3H7	Tablet & Envelope..	95% Spruce 5% Fir	65	10x1½	8x1½	130	4	2200	——	——	None	Pump	.....	3.875		4.875	1200	——	3400	21	54	7.75	8.5	162	9.2
3H8	News	80% Spruce 20% Fir	87½	8x½	7x½	145	4.75	2180	None	113	None	Meyer	.....	0.64	2.56	4.00	1200	0.61	2820	22	42	5.2	14.9	128	5.2
3H9	News	80% Spruce 20% Balsam	85	8x1¼	7x1¼	140	5.5	2190	None	127	None	Pump	.....	0.80	2.40	4.00	1400	0.36	3140	23	42	6.17	14.2	136	5.0
3H10	News	Spruce & Balsam	85	Spiral	——	——	——	2000	70	——	Claflin	None	.....	0.629	1.785	3.839	1645	0.103	3120	25	45	7.05	10.4	125	5.2
3H11	News	60% Spruce 35% Balsam 5% Pine	—	8 Dia. & 8 Thread		150	——	2280	None	——	Jordan	Pump	.....	1.20	1.80	3.32	1110	0.17	3530	32	42	9.5	14.0	110	9.7
3H12	News	60% Spruce 35% Balsam 5% Pine	—	8 Dia. & 8 Thread		150	——	2280	None	——	Jordan	Pump	.....	1.46	1.78	3.63	1110	0.20	3530	32	42	9.5	11.2	110	8.0
3H13	News	65% Spruce 30% Balsam 5% Pine	141	4 St. & 14 Dia.	& 10 Dia.	150	——	2280	None	——	Jordan	Pump	.....	0.58	0.87	1.80	1160	0.14	3660	26 & 37	42	8 & 11.4	12.6	140 & 99	13¾
3H14	News	70% Spruce 15% Fir 15% Hemlock	200	9&10x1½ & 12 Dia.	12x1¼	154	4.9	2000	None	57.53	None	Meyer	.....	1.10	1.40	2.09	850	——	3460	33	42	9.6	16.5	104	——
3H15	News	60% Spruce 30% Balsam 10% Pine	80	8x1½ & 9x1½		170	4	2100	None	32	None	None	.....	0.46	3.87	5.36	510	——	2620	32	37½	6.3	24.9	82	——
3H16	News	84% Spruce 15% Pine 1% Balsam	188	9x1¼	8x1¼	140	2 b.d.	2200	7	110	None	Meyer	.....	0.63	1.75	2.98	2580	0.14	3390	—	—	—	——	—	5.3
3H17	News & Hanging..	80% Spruce 15% Balsam 5% Pine	102	8x1¼	8x1¼	155.5	4.11	2200	None	——	None	Meyer	.....	0.87	1.86	3.32	1287	——	3100 & 3380	19 & 22	42	4.95 & 6.25	12.3 & 11.3	164 & 153	4.29
3H18	News	40% Spruce 50% Fir 10% Pine	120	8x1¼, 8 Spiral	4 Ft. 14 Dia.	160	5	2320	——	——	——	——	.....	0.631	1.263	2.594	1550	——	3250	24	48	7.5	12.8	135	9.5
4H2	News & Wrapping.	75% Hemlock 25% Spruce	76	10 Dia.	9 Dia.	160	4	2060	None	15	Voith	None	.....	1.00	2.28	4.81	1404	0.32	3530	22	58	9.0	9.2	160	6
4H3	News	60% Spruce 40% Balsam	71	9 Spiral & 14 Dia.		150	5	2200	None	——	None	None	.....	0.80	2.08	3.41	1000	0.405	3460	36	60	14.9	16.0	96	10
3E3	News	60% Hemlock 40% Spruce	90	9x3	9x3	165	5	2447	None	12	Berkshire & Horne Beaters	——	Westinghouse	1.17	1.17	3.044	——	0.46	——	31	44	——	——	—	—
3E4	News	65% Balsam 35% Spruce	125	9x1½ & 10x1½		145	7.5	2100	40	None	Jordan	——	None	0.96	1.92	3.84	725	——	3450	38	39	10.2	12.3	91	8.05
3E5	News	80% Spruce 15% Balsam 5% Pine	90	10x1	8x1	160	3.5	1860	80	1¼	Jordan	——	None	0.48	1.20	2.64	1200	0.40	3290	30	43	8.6	9.8	110	6.5
3E6	News	60% Spruce 40% Balsam	71	9 Spiral & 14 Dia.		150	5	2200	None	——	None	——	None	0.80	2.08	3.41	1000	0.405	3380	36	45	10.9	14.4	94	6.5
3E7	Tissue	100% Spruce	136	12&14 Dia.	4 Straight & 10x1½	115	.9	2250	None	None	None	——	Moore?	1.70	4.30	6.70	1000	——	3280	21	42	5.8	15.1	156	7
3E8	News & Board ...	95% Spruce 5% Balsam	152	No. 6 & No. 7 Dia.		142	3.5	2100	None	10	Jordan	——	None	1.38	1.45	3.36	1960	——	3380	36.3	45	11	13.6	93	——
3H9 [2]	News	70% Spruce 15% Fir 15% Hemlock	200	9&10x1½ 10&12 Dia.	12x1¼	154	4.9	2000	None	57.53	None	——	G. E.	1.10	1.40	2.09	850	——	3460	33	42	9.6	15.8	105	——
3E10	News	60% Spruce	35	8x1¼	6x1¼	175	4.6	2000	130	None	Claflin	——	None	0.505	1.136	2.016	1017	——	3680	46	48	16.3	14.9	80	7

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Mill Number	Kind of Pulp Produced	Kind of Wood Used	Size of Wood	Burr Used: Summer	Burr Used: Winter	Temperature in Grinder Pit—° F.	Consistency in Grinder Pit—%	Yield of First-grade Pulp—lb./cd.	Yield of Second-grade Pulp—lb./cd.	Total Waste—Slivers and White Water—%	Type of Refiner Used	Type of Speed Regulator Used	Type of Load Regulator Used	Labor per Cord—Wood Handlers	Labor per Cord—Grindermen	Labor per Cord—Total	Stone Life—Cords	Maintenance Cost of Grinders	Peripheral Speed—f.p.m.	Unit Pressure	Unit Surface	Unit Capacity	Unit Power	Pressure-Speed Ratio	Wood Ground per Grinder Day—Cords
3E11[3]	News	60% Spruce 35% Balsam 5% Pine		8 Dia. & 8 Thread		150	—	2280	None	—	Jordan	—	None	1.46	1.78	3.63	1110	0.20	3530	32	42	9.5	10.1	110	8
3E12[5]	News	60% Spruce 30% Balsam 10% Pine	80	8x1½ & 9x1½		170	4	2100	None	32	None	—	None	0.46	3.87	5.36	510	—	3390	32	37½	8.1	16.4	106	—
3E13[4]	News	40% Spruce 40% Hemlock 20% Fir	65	10x1¼ & 9 & 7 Dia.		165	3.5	2200	Wrapper	—	Berkshire	—	None	0.20	1.00	1.50	1457	—	3510	32	42	9.4	14.1	110	13.3
4E1	News & Tissue ...	80% Spruce 20% Balsam	125	12x14Dia.	4 Straight	130	1	2000	None	—	None	—	Meyer	1.20	2.40	6.00	700	—	3760	28	60	12.6	10.6	134	9.6
4E2	News & Wrapping.	75% Hemlock 25% Spruce	76	10 Dia.	9 Dia.	160	4	2060	None	15	Voith	—	Westinghouse	1.00	2.28	4.99	1404	0.32	3530	25	50	8.8	10.6	140	6
4E3	News	60% Spruce 40% Fir	85	8 Spiral	6 Straight	170	7 b.d.	2100	None	39.08	None	—	None	0.549	1.646	2.745	2000	—	3760	40	61	18.4	15.2	94	16
4E4	News	Spruce	170	4 Straight	& 14 Dia.	150	4	2450	19.5 sold	10	None	—	None	0.90	1.80	4.10	1600	—	3760	34	62	15.8	14.3	110	12
4E5	News ...	15% Pine 84% Spruce 1% Balsam	188	9x1¼	8x1¼	140	2 b.d.	2240	5.56	110	None	—	Meyer	0.40	1.21	2.12	3100	0.90	3760	—	—	—	—	—	8
4E6	Magazine..	5% Pine 15% Balsam 80% Spruce	102	8x1¼	8x1¼	119	7	2200	None	—	None	—	None	0.87	2.42	3.88	1287	—	3760	21	56	8.9	9.5	180	6.4
MH1C	News.....	60% Hemlock 40% Spruce	90	9x3	9x3	165	5	2447	67	12	Berkshire & Horne Woodward Beaters		Voith	1.20	1.20	3.104	988	0.46	3680	35	38	9.8	21.2	105	20
MH2	News.....	70% Spruce 30% Balsam	58	Spiral	& Dia.	140	4	2200R	65	None	Voith	Voith	.....	1.20	1.20	3.00	3200	—	3950	32	61	15.4	10.4	124	16
ME1	News.....	50% Spruce 50% Balsam	85	10x1¼	8x1¼	160	5	2100	50	10	Jordan & Beater	—	Waterous	0.80	0.80	2.00	2900	0.10	3450	34	61	14.3	11.9	101	16
ME2	News.....	Spruce & Balsam	110	8 Spiral	8 Spiral	165	4	2280	200	None	B'kshire	—	Voith	0.38	0.42	1.25	2250	—	4100	42	61	21.0	10.4	98	—
ME3	News & Tissue ...	75% Spruce 25% Poplar	120	—	—	150	7½	1743R	None	—	Voith	—	Meyer	1.60	0.80	2.67	5000	0.15	3950	—	—	—	—	—	20
ME4C	News.....	Spruce & Balsam	85	Spiral	Spiral	145	—	2000	70	—	Claflin	—	Voith	0.553	0.428	1.425	1150	0.60	3960&4200	22	38	6.7	13.7	180	16
ME5	News.....	80% Spruce 20% Balsam	105	9x1	8x1	150	3.1	2360	None	85	None	—	Waterous	0.414	0.414	1.335	4500	0.70	3640	34	61	15.2	10.3	107	14.5
ME6C	Manilas...	50% Spruce 40% Balsam 10% Hemlock & Pine	—	10x2 Sp. 8 Dia.	9x2 Sp.	155	—	2180	—	—	None	—	G. E.	—	—	—	3396	—	3900	28	34	7.5	17.3	140	18

EXPLANATION OF ABBREVIATIONS AND TERMS USED IN TABLE

[1] Per 1,000 bd. ft. instead of per cord.
[2] Production data and some other figures same as for 3H14.
[3] Production data and some other figures same as for 3H12.
[5] Production data and some other figures same as for 3H15.
Sp.= Spruce; Hem.= Hemlock;
Bal.= Balsam; Pop.= Poplar.

9 x 1½ = No. 9 spiral burr with 1½ inch lead; "st." means a burr grooved straight across; "dia." means diamond point burr; percentage figures preceding the description of the burr indicates the percentage of time the given burr is used.

When the same burr is used during both summer and winter the conjunction "and" is used or ditto marks are shown.

Temperature is given in degrees Fahrenheit, and consistency in per cent air dry unless the letters b.d. appear for "bone dry."

"R" means rough cords.

Yield is given in pounds per cord. Where sawed wood is used the yield per cord is naturally high.

If a mill replied that there was no waste then the word "none" is given. Unless a definite statement to that effect was made a dash appears in the table.

Labor is given in man-hours per cord. Some of the figures reported by the mills do not indicate that they are based on actual records.

Stone life is stated in cords of wood ground. Maintenance cost in cents per cord.

Peripheral speed is stated in circumferential feet per minute for new grindstones.

UNIT PRESSURE = Grinding pressure in pounds per square in. of pocket area =

$$\frac{\text{Gage Pressure} \times \text{Cylinder Area}}{\text{Width of pocket} \times \text{length of wood}}$$

UNIT SURFACE = Number of pockets × width of pockets in inches.

UNIT CAPACITY = (Unit pressure × unit surface × peripheral speed ÷ 500 thousand.

UNIT POWER = Horsepower consumed per one thousand feet peripheral speed per hundred square inches pocket area.

COMPUTED GAGE PRESSURE (pounds per square inch in cylinder) =

$$\frac{12 \times 33{,}000 \times \text{hp.}}{A \times C \times N \times R \times D \times Pi}$$

hp. = Horsepower per grinder.
A = Area of cylinders in square inches.
C = Coefficient of grinding friction (average value taken as 0.2).
N = Number of pockets per grinder.
K = Revolutions of grinder per minute.
D = Average diameter of grindstone in inches.
Pi = 3.1416.

The method of computing unit pressure, surface, etc., may be illustrated as follows: Assume:

R.P.M. of grinder	215
Horsepower per grinder	512
Diameter of cylinder	14 inches
Width of pocket	15 inches
Length of wood used	24 inches
Diameter of grindstone when new	54 inches
Number of pockets per grinder	3

From the R.P.M. and an average grindstone circumference of about 12 feet, we get 2,600 (2.6 thousand) feet peripheral speed.

From the length of wood used and the width of pocket, we get 360 (3.6 hundred) square inches pocket area.

$$\text{Unit Pressure} = \frac{50 \times 154}{24 \times 15} = 22$$

$$\text{Unit surface} = 3 \times 15 = 45$$

$$\text{Unit Capacity} = \frac{2{,}600 \times 22 \times 45}{500{,}000} = 5.2$$

$$\text{Unit Power} = \frac{144}{2.6 \times 3.6} = 15$$

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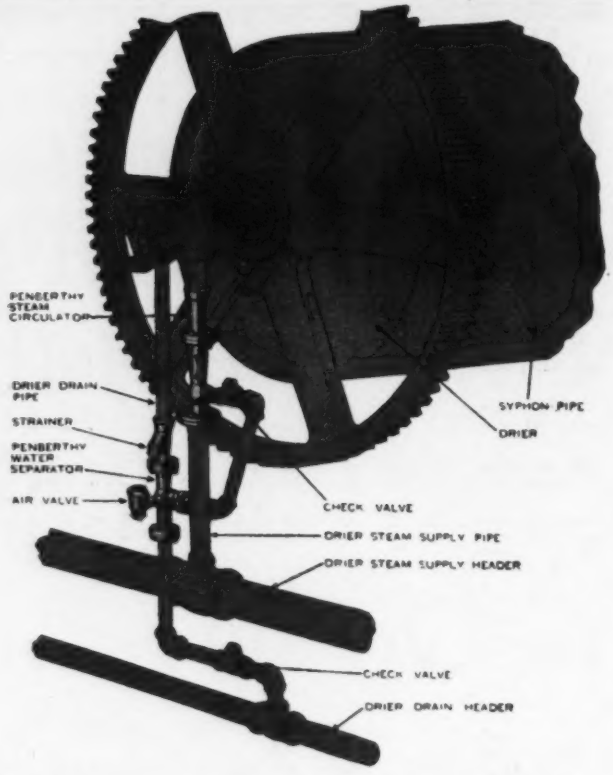

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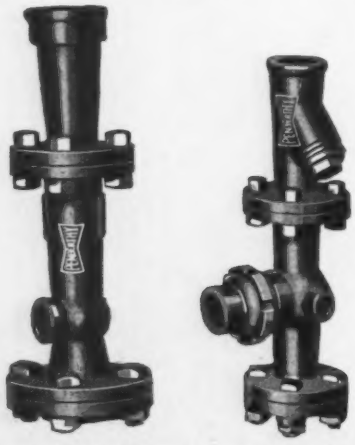

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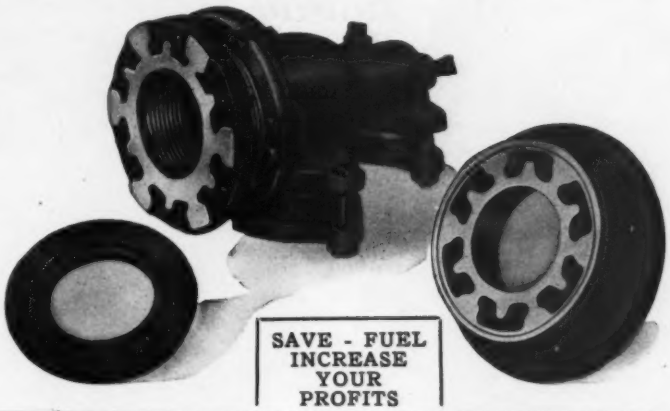

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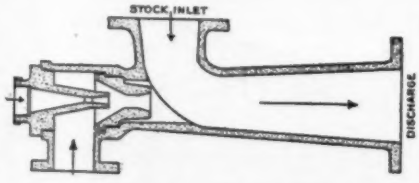

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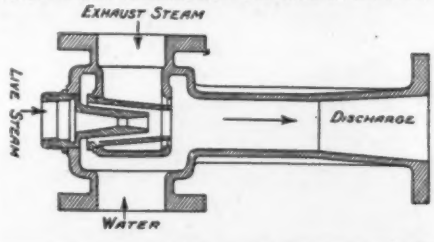

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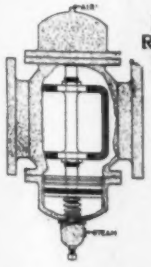

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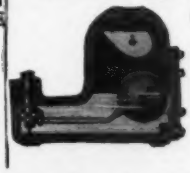

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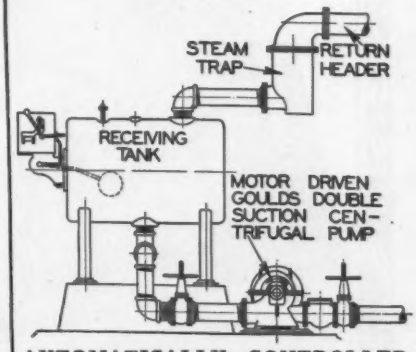

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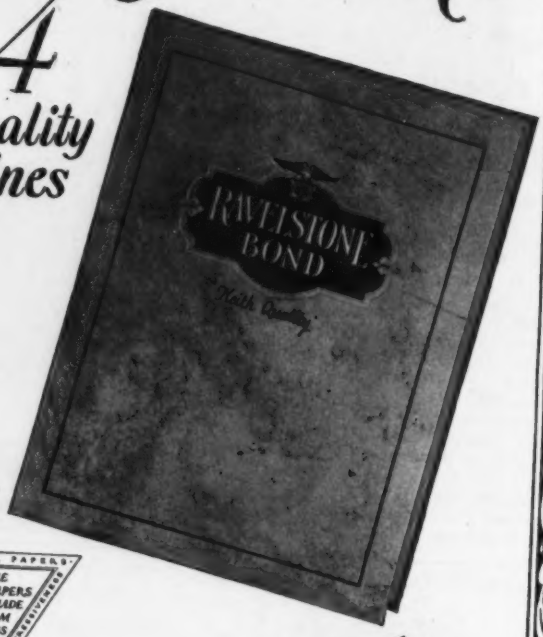

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Some of the data, such as sharpenings per 24 hours have not been summarized because we had no information respecting the manner in which the burr was applied. Six sharpenings per day for mill 3H1 may not represent a total deeper marking of the stone each way than one sharpening for mill 3H5.

Although certain questions were asked from which it was hoped the power consumption could be computed more accurately and on a comparable basis for all mills, the answers received were so unsatisfactory that all data relative thereto are omitted from the present tabulation.

Instead of stating the number of cords ground per grinder day most of the mills stated the total number of cords ground per day.

Instead of stating *normal* horsepower most of the mills gave the motor or waterwheel rating with no relation between actual power used and production secured. Perhaps it would be better in the future to specify how the horsepower used per cord of wood ground is to be figured, and then to let each mill compute its own horsepower consumed per cord ground.

A system of numbering was used for the mills which was designed to assist in comparing different kinds of grinders. The first figure denotes the number of pockets per grinder. For example: 3 refers to a mill having 3 picket grinders, 4 refers to a mill having four pocket grinders, and "M" refers to a mill having magazine grinders of either the two-pocket hydraulic feed or the caterpillar feed type.

The second figure or letter denotes the kind of power used to drive the grinders. "H" indicates that the grinders are driven by hydraulic turbines. "E" indicates that the grinders are driven by electric motors.

The third figure denotes the serial number of the mill reporting. When a fourth figure appears in parenthesis after the other three it denotes that the mill is using four foot wood in hand-fed pocket grinders.

Small figures in parentheseis to the right and above the mill number refer to foot notes.

Knife barkers are in use in three mills. Western mills using sawed wood trim with disk barkers. Some of the eastern mills use peeled wood. Twenty-nine mills use drum barkers.

Peripheral speeds vary from 2050 to 4100 feet per minute.

Unit pressures used vary from 21 to 45 for three pocket grinders; from 21 to 40 for four pocket grinders; from 32 to 42 for the pocket magazine grinders; and from 22 to 35 for the caterpillar grinders.

The production in cords of wood ground per grinder day varies from 4.3 to 13.7 for the three pocket grinders averaging 7.8; from 6.0 to 16.0 for the four pocket grinders averaging 9.25; from 14.5 to 20.0 for the pocket magazine grinders averaging 16.6; and from 16.0 to 20.0 for the caterpillar grinders averaging 18 cords.

The average ratio of cords ground to unit capacity is 0.92 for the three pocket grinders; 0.75 for the four pocket grinders; 1.03 for the pocket magazine grinders; and 2.25 for the caterpillars.

The computed gage pressure for the pocket magazine grinders is only about half that reported used by the mills even though the gage pressures computed by the same formula for hand-fed pocket grinders checks the observed gage pressures very well.

In order to get some indication of unit pressures used in the caterpillar grinders the following formula was developed from the formula for computed Gage Pressure:

$$\text{Unit Pressure} = \frac{\text{Gage Pressure} \times A}{\text{Pocket Area}}$$

$$\text{Gage Pressure} = \frac{\text{Unit Pressure} \times \text{Pocket Area}}{A}$$

$$\text{Unit Pressure for caterpillars} = \frac{12x33{,}000xH.P.}{CxNxRxDxPixPocket\ Area}$$

If the mills report normal gage pressure correctly then it represents the average pressure used while the grindstones vary in diameter from new to wornout, and therefore the computed peripheral speed should be based on the *mean* grindstone diameter instead of the diameter new.

It would appear desirable to request, also, the number of grinder lines in the mill.

Pressure of other work has prevented a fuller discussion, by the writer, of the data collected, but it is hoped that others will study the table presented and comment fully at the annual meeting.

Power Requirements of Paper Mill Machinery

By S. A. Staege[1] and C. U. Smith[2]

This paper is in continuation of the work undertaken last year by the Heat, Light and Power Committee of presenting information on the power requirements of various machines as used in the industry for the use and benefit of the membership and for the records of the Association.

Not only is the power data being compiled intended for the guidance of those having to make applications of motors to various machines and to aid them in the selection of the proper sizes of equipment, but one of the major objects of this work is to point out improvements in present over past practice, to indicate ways in which these improvements have been effected, and to point out lines along which improvement can be expected in the future.

When we contemplate the vast amount of power used in the paper industry and when we consider that more than three million horsepower of energy is expended in the pulp and paper mills of the United States and Canada, are we not led to speculate as to whether so much power is really necessary and whether perhaps a few million dollars each year, taken from the revenues of mill operation and expended for power, should not go into profit? Such indeed is the case. There are opportunities for reducing the power consumption all through the mill.

The Papermachine

The papermachine is an outstanding example of marked economies in power consumption that have been effected in the past few years and much remains to be done. Improved bearings for table and felt rolls have gone into universal use. Calender bearings have been so improved in design and construction that in best modern practice today, a calender stack requires no more than half or one-third of the power necessary for a similar size and speed stack only a few years ago, and in the best present day practice the papermachine driers take no more than one-third of the power found necessary only four or five years ago.

Improvements have also been made in other parts of the machine which have had their beneficial effect.

Probably the largest single item in reducing the power requirements of the papermachine has been the entire elimination of the old style mechanical drive. The more direct application of power with sectional electric drive with the elimination of inefficient mechanical transmission machinery, frequently effects savings in power of from 25 to 50 per cent.

Further reductions in the power required for the papermachine itself can be reasonably made, probably to the extent of a least an additional 50 per cent. Still further improvements in bearings can be made, especially where heavy loads are carried or where temperature is a factor, in cases such as calenders, driers and presses, by the use of sleeve bearings of more adequate design or by the use of antifriction bearings. Suction boxes designed to reduce friction, or their equivalent arranged to rotate with the

[1] Member TAPPI; Industrial Engineer, Westinghouse Elect. & Mfg. Co.
[2] General Engineering Department, Westinghouse Electric & Mfg. Co.

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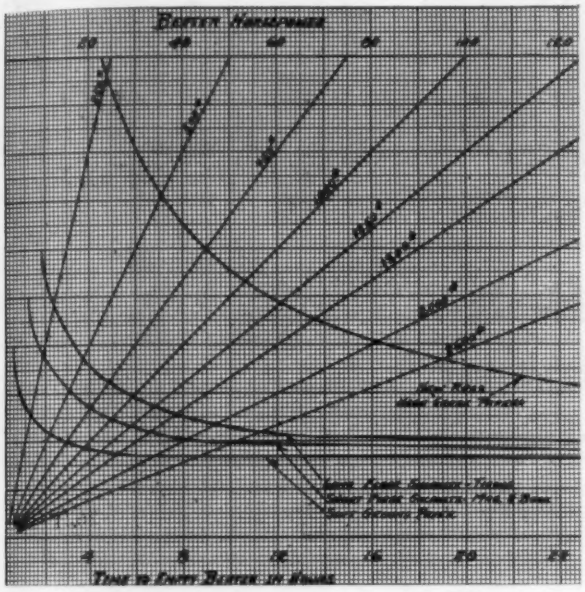
CYLINDER MACHINE SPECIALTIES

wire, would substantially reduce the power required at the forming end of the machine.

Four or five years ago the power required for news machines with sectional electric drive averaged about 0.25 kw. per inch width per 100 ft. speed, ranging from 0.19 to 0.30 kw. This is the electrical input to the motor. Today, the best news machine practice is approximately 0.15 kw.

Here is a reduction in power of 40 per cent on the paper machine proper. This came following the advent of electrical



HORSEPOWER REQUIREMENTS OF BEATERS
(Based on Cutting Speed of 1,500 Feet per Minute)

To Read Power—Start with beating time in hours and proceed vertically to intersection with curve showing kind of stock, then proceed horizontally to intersection with radial line showing beater capacity. From this point proceed vertically to upper scale and read hp. required.

sectional drive which made possible an analysis of load conditions.

When the machine builders know the situation and are made aware of the fact that their customers are interested in saving power, they have shown a disposition to do their part in improving design and they have accomplished notable achievements. There are more worlds to conquer, however, and I want to call upon the machinery manufacturers and their design engineers to stimulate their imagination and put into execution improvements in design and construction which will set new landmarks in progress and save hundreds of thousands of dollars annually for the mills by the elimination of waste in power.

POWER REQUIREMENTS OF JORDANS

Item No.	Jordan Manufacturer	Size or Type	Kind of Stock	Tons per 24 hrs.	RPM of Jordan	Hp. Installed	Average hp Required.
1.	Noble & Wood Co.	Mammoth, Jr.	Filler	— —	285	75	70
2.	Noble & Wood Co.	Mammoth, Jr.	Filler	— —	285	75	70
3.	Noble & Wood Co.	Mammoth, Jr.	Liner	— —	285	75	83
4.	Appleton Mach. Co.	....	Kraft	15.	400	250	286
5.	Appleton Mach. Co.	....	Kraft	8.	450	150	151
6.	Shartle Bros. Mach. Co.	Miami No. 2	Old Papers	— —	435	100	115
7.	Shartle Bros. Mach. Co.	Miami No. 2	Old Papers	— —	435	100	101
8.	Black-Clawson Co.	No. 2	Top Liner	22.	400	100	130
9.	Noble & Wood Co.	Bull-Dog	BackLiner	36.	400	100	125
10.	Noble & Wood Co.	Bull-Dog	Top Liner	36.	400	125	140
11.	Shartle Bros. Mach. Co.	Miami No. 2	Kraft	— —	385	125	105
12.	E. D. Jones & Sons Co.	Majestic	Rag	— —	315	150	172
13.	E. D. Jones & Sons Co.	Majestic	Bond	— —	315	150	147
14.	Appleton Mach. Co.	No. 2	Bond	— —	385	150	131
15.	E. D. Jones & Sons, Co.	Majestic	Sulphite	— —	375	150	153
16.	Noble & Wood Co.	Mammoth, Jr.	Old News	— —	285	75	66
17.	Noble & Wood Co.	Mammoth, Jr.	Kraft	— —	285	75	100
18.	E. D. Jones & Sons Co.	Standard	Manila	— —	425	75	52
19.	Shartle Bros. Mach. Co.	Miami No. 2	Filler	— —	435	150	130
20.	Shartle Bros. Mach. Co.	Miami No. 2	Liner	— —	435	150	108
21.	Shartle Bros. Mach. Co.	Miami No. 2	Liner	22.	385	125	128
22.	Shartle Bros. Mach. Co.	Miami No. 2	Filler	24.	385	125	87
23.	Appleton Mach. Co.	No. 2	Rag	8.5	385	150	127
24.	Appleton Mach. Co.	No. 2	Rag & Sulphite	9.5	385	150	131
25.	Appleton Mach. Co.	No. 2	Rag & Sulphite	8.0	385	150	134
26.	Appleton Mach. Co.	No. 2	Rag & Sulphite	8.0	385	150	134
27.	E. D. Jones & Sons Co.	Imperial	Book	22.0	400	150	161
28.	J. H. Horne & Son Co.	....	News	— —	368	75	65
29.	E. D. Jones & Sons Co.	Majestic	News	— —	315	150	115
30.	E. D. Jones & Sons Co.	Majestic	Book	— —	375	150	153

A New Table

Last year there was presented a table showing the power input to sectional electrically driven fourdrinier papermachines. This table from power readings of numerous machines gave figures on some of the oldest and some of the latest machines as of that date, with some of high power consumption and some showing very economical performance. Since that time a number of new machines have been put into service and a new table is presented at this time showing some of the low power machines in the industry today. These figures should serve as marks to aim for and as a stimulus upon which to try to improve.

Beaters

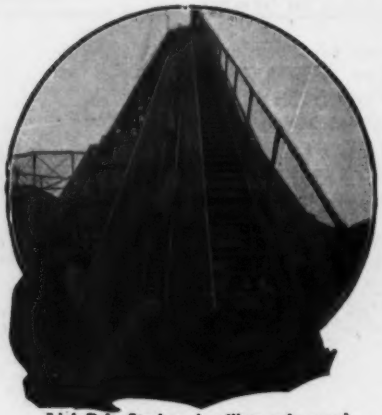
A great variety of conditions obtain with respect to the power requirements of beaters. The kind of stock, the length of time of beating, the size of beater and the peripheral speed of the roll,

POWER INPUT TO SECTIONAL ELECTRICALLY DRIVEN FOURDRINIER PAPER MACHINES

KW. Per Inch Width Per 100 Ft. Per Min. Paper Speed

Item No.	Width in Inches	Kind of Paper	Speed in f.p.m.	Couch	1st Press	2nd Press	3rd Press	1st Dryer Section	1st Dryer Per Roll	2nd Dryer Section	2nd Dryer Per Roll	1st Calender	2nd Calender	Breaker Roll	Reel	Gen. Output	Remarks
1	234	News	850	0.032	0.015	0.020	0.020	0.021	0.0009	0.021	0.0009	0.029	....	.....	.....	0.154	Cal. includes reel.
2	234	News	825	0.041	0.023	0.018	0.019	0.017	0.0008	0.017	0.0008	0.023	....	.....	0.0062	0.166	
3	234	News	670	0.029	0.017	0.013	0.013	0.019	0.0009	0.013	0.0006	0.026	....	.....	.....	0.129	Cal. includes reel.
4	164	News	1026	0.038	0.011	0.009	0.014	0.026	0.0011	0.042	0.0018	0.015	....	.....	0.0046	0.164	
5	234	News	750	0.057	0.021	0.013	0.015	0.015	0.0008	0.016	0.0009	0.028	....	.....	.....	0.166	Cal. includes reel.
6	234	News	750	0.033	0.020	0.015	0.016	0.017	0.0009	0.017	0.0009	0.027	....	.....	.....	0.145	Cal. includes reel.
7	234	News	765	0.035	0.021	0.016	0.017	0.015	0.0009	0.020	0.0012	0.020	....	.....	0.0057	0.156	
8	234	News	765	0.023	0.021	0.016	0.016	0.013	0.0007	0.012	0.0007	0.012	....	.....	0.0057	0.146	
9	234	News	790	0.044	0.022	0.018	0.021	0.015	0.0009	0.012	0.0007	0.022	....	.....	0.0061	0.160	
10	234	News	760	0.040	0.022	0.018	0.021	0.011	0.0006	0.015	0.0009	0.022	....	.....	0.0063	0.156	
11	152	Book	295	0.054	0.017	0.019	0.019	0.029	0.0007	....	.....	0.012	0.019	0.0043	0.0054	0.139	
12	200	Book	250	0.019	0.010	0.011	0.009	0.011	0.0007	0.005	0.0004	0.017	0.019	0.0024	0.0090	0.118	
13	200	Book	308	0.019	0.012	0.012	0.011	0.014	0.0009	0.009	0.0007	0.010	0.030	0.0024	0.0065	0.125	
14	196	Book	281	0.020	0.016	0.013	0.009	0.020	0.0007	....	.....	0.012	0.015	0.0037	0.0037	0.112	
15	152	Book	275	0.055	0.020	0.020	0.020	0.024	0.0010	....	.....	0.014	0.027	0.0047	0.0060	0.146	
16	136	Parchment	335	0.035	0.026	0.021	0.018	0.032	0.0009	....	.....	0.035	....	.....	.....	0.169	Cal. includes reel.
17	116	Bond	400	0.033	0.017	0.009	0.007	0.012	0.0007	0.007	0.0004	0.005	0.014	.....	0.0130	0.126	
18	174	Kraft	207	0.029	0.018	0.012	0.015	0.024	0.0012	0.014	0.0007	0.021	....	.....	0.0100	0.143	
19	174	Kraft	635	0.031	0.019	0.010	0.011	0.030	0.0015	0.022	0.0011	0.009	....	.....	0.0060	0.142	

Link-Belt Silent Chain—strong, positive means of transmitting power.



Link-Belt Stacker, handling pulp wood in storage yard of a large Paper Mill.

Link-Belt Roller Chain—for double reduction and other high speed service.

Belt Conveyors for handling raw or finished products.

Link-Belt Equipment for the Paper Mill

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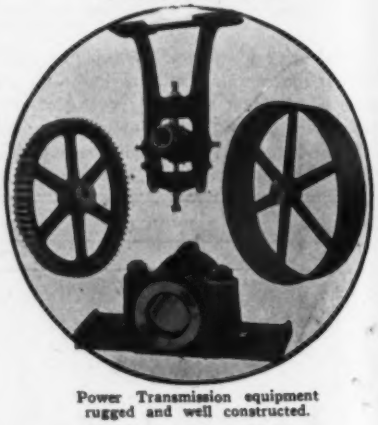
Chains for elevating, conveying and power transmission.



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LINK-BELT

Elevating, Conveying and Power Transmission Machinery

all affect the power consumption as well as do details of design of the beater itself.

A chart is here presented based upon extensive investigation which is intended to show the horsepower requirements for the various conditions indicated. This is based upon the conventional practice of the past and does not necessarily cover adequately some of the latest practice and developments in improved circulation, high cutting speed or exceptionally large size or special design of beaters.

The energy lost in bearing friction in the beater and drive will probably vary from 10 to 25 per cent of the total power output of the driving unit, or the total power absorbed by the beater and drive.

Many beaters in every day use are in such a condition mechanically that great improvement could be made, particularly in bearing design and lubrication which would reduce the power consumption to a very noticeable degree and it is to be hoped that an interest not heretofore exhibited will be taken to the end that unnecessary losses may be greatly reduced.

Jordans

On the subject of jordan drives, the power requirements are subject to great variation depending upon the kind of stock, the nature of the work to be done upon it and the individual ideas of the operator. A table is presented showing a few more or less typical cases but no effort is being made at this time to go further than that.

Beginning Being Made

As indicated a year ago, in the presentation of the paper at that time on this same subject, a beginning is being made but only a beginning of the very extensive work which should be done along the lines which the Committee has undertaken and the material presented in this paper, while very incomplete, it is hoped will prompt suggestions and constructive criticisms and the contribution of new material so that our fund of knowledge on the subject of power requirements of pulp and paper mill machinery will be constantly increased and so that the latest, best and most advanced practice may be made available.

Drying Paper on Yankee Machines

By S. W. Fletcher*

With the use of large Yankee machines increasing in favor for certain classes of paper, it was recognized that the vapor leaving the Yankee drier presented a ventilating problem, and steps were taken to meet this problem.

Naturally, the first development was to hood the drier. This was done by building up a wooden hood. These first hoods were poorly designed and crudely built, and in many cases did not have sufficient outlet area to allow the vapor to escape. Although the installation of these hoods increased the overall efficiency of the drying somewhat, it did not serve its complete purpose, and this led to improvements.

Double Hood

The next step was to build a double hood arrangement, the inner part of which served as an air supply duct to blow air on the sheet by means of openings through it. The vapor then was carried away by a large outer hood which inclosed the inner one. This was a decided improvement in the development of hoods for Yankee machines and probably led to the design of hood which is in general use on most of the latest Yankee driers.

This hood is primarily an air duct which follows the contour of the drier for about three quarters of its perimeter and is practically the same width as the drier. The hood is built up in two sections, one for each side of the drier face, to allow an opening at the top for the exhaust vapor. The inside of this duct is perforated with special slotted openings to direct the air so that it blows directly against the sheet. The distance from this perforated sheet to the drier, which is fairly small at the bottom of the hood, gradually increases as it approaches the top of the drier. The air is introduced into this duct part of the hood on both sides near the bottom of the hood, and distributes over the entire hooded portion of the machine.

Hood Operation

As stated above, the vapor is taken out at the top, and the space between the perforated sheet and the drier serves as a conveyor for this vapor. The velocity of the outgoing vapor is kept at a low figure by increasing the area of this space as described above, and this allows the high velocity supply air to penetrate this outgoing vapor and reach the sheet.

The hood is of an all-metal construction built up in two or more sections to allow access to the drier for repairs, and is durable, sightly, and fireproof.

Having pictured the design and construction of the hood, it is interesting to note the results accomplished. A number of these hoods have been installed and several tests have been made, and the average increased production obtained by putting the air on the machine and exhausting it properly, has been between 15 and 25 per cent. On first observation, this does not seem to be very startling, but when it is considered that a Yankee machine dries about four times as much paper per square foot of drier surface, as a news machine, and that 20 per cent increases this figure to about five times, it will be realized what this air accomplishes.

The amount of drying obtained on a Yankee machine is undoubtedly due to the fact that the paper is "ironed" to the drier, securing perfect contact, and to the fact that the machine operates without drier felts. The absence of drier felts allows the air to be introduced against the sheet in a way to obtain maximum results in absorbing the vapor. It is the immediate evaporation of this vapor forced out by the drier, as well as the warming and air drying effect on the exposed side of the sheet that brings about the increased production.

High Temperature Necessary

As is generally the case, there are certain requirements necessary to accomplish the above results. Fairly high temperature air must be used and there are many opinions on the correct temperature. These vary from 135 degrees F. to 180 degrees F. The advocates of the 135 degrees F. temperature state that while there is no noticeable increase in production when the temperature is raised, there is a noticeable decrease when the temperature falls below this point. The users of the higher temperature claim that the increase in temperature is justified by the increase in production. I believe the majority of these installations operate at about 150 degrees F. entering air temperature. With a constant volume of air the rate of evaporation should increase with the increase in temperature. It has also been found necessary to use comparatively large volumes of air for the tonnage of the machine to obtain the best results. This large quantity of air passing over the Yankee machine leaves the drier considerably below the saturation point, and is exhausted to the atmosphere without doing its full duty. The cost of heating this quantity of air to a high temperature must of course be charged against the drying, and this has been a drawback to the Yankee machine.

This difficulty was overcome by the installation of a Briner economizer in conjunction with the hood. This economizer cools this outgoing vapor, recovers the otherwise wasted heat, and utilizes this recovered heat to heat the fresh air supply for the system. Such an installation makes a showing which compares

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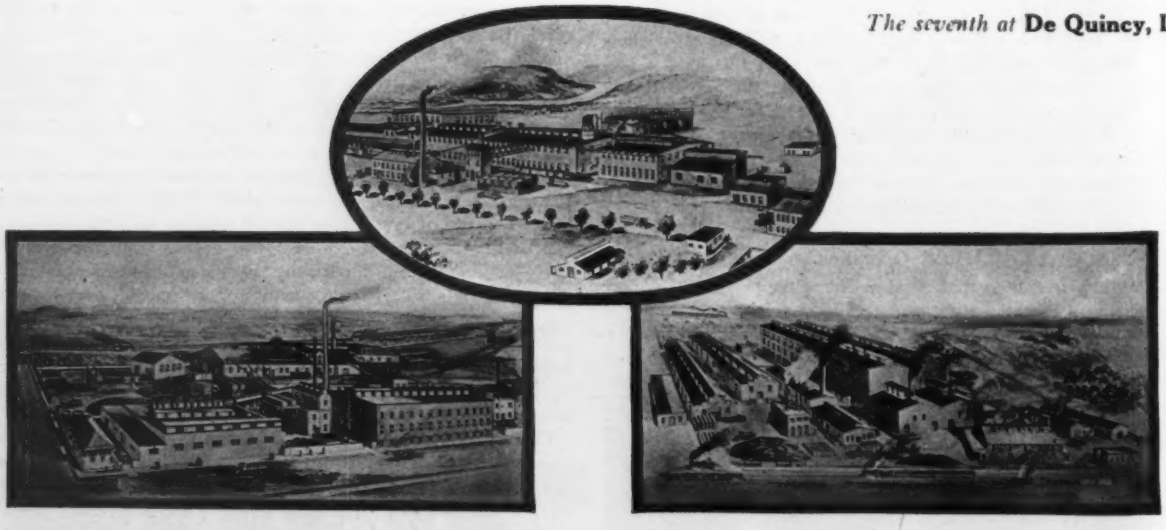
ACIDS—Muriatic, Sulphuric, Nitric, and Other Chemicals.

SIX FAC

The seventh at **De Quincy, La.**



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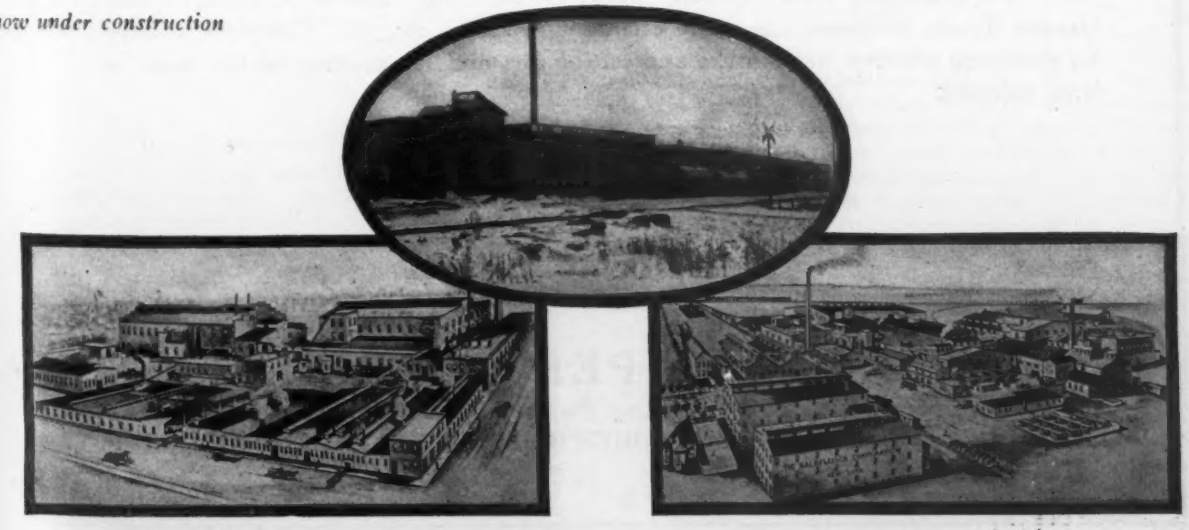

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IN a business so diversified, it is always difficult to keep the range of our work and products before the Trade. With operations beginning with lumbering, and ending with such refinements as embossing and color-printing, small wonder that sometimes our oldest friends go elsewhere for goods they would be only too glad to buy from us. Below you will find brief reminders of the more important Union Lines.

Paper

"Drum Head Kraft" Wrapping Paper, 25-80 lbs., basis. On special order, Drum Head Kraft can be furnished in striped form or with individual marking, and in almost any color.

"Sachem Fibre," 25 lbs., and 30 lbs., basis only; a natural dry-finish, all Sulphite wrapper, popular in many trades.

Specialties: Various special papers can be furnished upon request, in both Kraft and Sulphite, including a line of Bleached Sulphite Papers, in White and Colors, 25-80 lbs., basis. Notion Envelope, Black and Gasket Papers; Papers for Waterproofing, Waxing and Twisting; etc.; etc.

Paper Bags

Grocers' Bags, including the well-known Animal Line of "Not-A-Seam" Automatics. Carton-Liner, Candy, Notion, Bread, Sandwich, Pastry, Cake, Doughnut, Glassine, Potato Chips, Peanut, Bacon & Lard-Liner, Nail, Sugar, Banana, Millinery, Shirt, Shirtwaist; Handle, Garment, and Cigar & Tobacco Bags; *The* UNION DUPLEX COFFEE BAGS; *The* UNION SHOPPING BAG. Widest facilities for the designing and manufacture of Special (made-to-order) Paper Bags, and two of the most complete printing-plants in the industry.

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favorably with a two deck machine. I recall a machine thus equipped, where they have reported a steam consumption of less than 3 pounds of steam per pound of paper the year around, and this includes the steam for heating the air as well as that used in the drier. In this particular installation, the steam used in the drier and air heater all comes from the engine driving the machine.

Steam Piping Described

The steam piping arrangement used on this installation as well as several others, while it has been used on similar installations for many years, is rather unique and interesting. The exhaust from the engine is connected directly to the drier and the drain from the drier is connected to the heating coils for the air supply. This connection from the drier to the heating coils is dripped to a trap which takes care of the condensate from the drier, leaving the "flash" steam for the heating coils. The drying is controlled entirely by one valve placed in the line between the drier and the heater, but once this valve is set, it requires very little attention. Several installations have an auxiliary live steam connection to the heaters, which is used to warm up the whole system when the apparatus is started up after a lengthy shut-down and before the drying is started on the machine.

It might be well to consider a typical installation of a Yankee machine completely equipped with the improved hood and Briner economizer, and turning out 20 tons production in 23 hours running time, in a climate which has an average yearly temperature of 45 degrees F. With this outside temperature entering the economizer, the test on this particular installation showed a temperature of 98 degrees F. leaving the economizer. The saving in steam involved in this installation at a steam cost of fifty cents per thousand pounds amounts to over $5,000 per year. The greatest return on the economizer is shown during the coldest weather and there is only a small difference in the final temperature leaving the economizer when the outside temperature varies. This means that the steam demands for heating the air are practically constant the year around, and also explains why the steam piping arrangement described above works out so satisfactorily on this type of installation.

Many Benefits

There are so many intangible benefits derived from the complete installation, it is difficult to separate the results obtained from any particular part of the equipment.

It is the intention of this paper to show the advances made in the proper use of air in connection with Yankee machines, and no doubt the efficiency that is now shown on a Yankee installation will lead to a more extensive use of these machines.

Soda Estimation By Electrical Conductivity*

By Clinton K. Textor and Walter F. Hoffman

The cost of replacement soda in soda and sulphate mills requires that soda losses be kept at a minimum; to do so it is desirable to have an easy and rapid method of estimating the losses in the various mill effluents as well as in the washed pulp, carbon sludge, etc. Due to the time required for gravimetric determinations such tests are usually few in number and control methods are generally based on hydrometer readings and other crude methods.

In searching for a reasonably accurate, rapid and economical method to total soda determination, it was considered advisable to

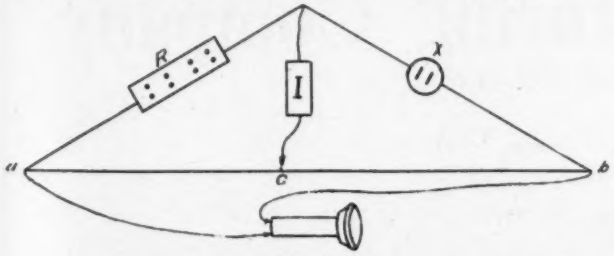

FIG. 1

Wheatstone Bridge.

investigate the application of the well known fact that the electrical conductivity[1] of a solution is a function of the concentration of electrolytes in it. Generally there is a specific relationship between conductance and concentration for each salt. Most liquors employed in pulp mills contain several sodium compounds, but provided these are always present in approximately the same proportions it is not unreasonable to expect that for each type of liquor there is a definite relation between specific conductivity[2] and total soda content. This expectation is borne out by experimental evidence.

Wheatstone Bridge Method

For measuring the resistance of a solution, the Wheatstone bridge method is usually employed. The wiring arrangement is shown diagrammatically in Fig 1, where I is a source of high frequency alternating current, R is a resistance box, and X is a conductivity cell containing the solution to be investigated. A telephone is connected to the ends of a uniform wire, ab, which is stretched above a scale divided into millimeters. A resistance r is inserted in R, which is of the same magnitude as that in the conductivity vessel X, and the sliding contact c is moved along the wire ab until the point of minimum sound in the telephone is obtained. The resistance of X is then given by,

$$x = \frac{r\,cb}{ca}$$

This value of x represents the resistivity of the solution, but not the specific resistance, unless the electrodes of the conductivity cell are exactly 1 sq. cm. in area and 1 cm. apart. To overcome this, the measured resistance must be multiplied by a factor. This factor is known as the resistance capacity of the cell or the cell constant. The cell constant can be easily obtained by measuring the conductance C' of a liquid of known specific conductivity. For standardizing the cells described below n/10 or n/100 potassium chloride is commonly used[3]. It will be evident that if C is the specific conductivity and C' is the measured conductance of the standard solution, the cell constant K will be,

$$K = \frac{C}{C'}$$

The cell constant K is then used in calculating the specific conductance or conductivity. If the resistance of the unknown solution is r, the specific conductivity K is,

$$K = \frac{C}{C'}$$

---

* From The Chemical Laboratory of The Northwest Paper Company, Cloquet, Minnesota.

[1] The reader is referred to "Practical Physical Chemistry," by Findlay, or any other physical chemistry text book for the theoretical discussion of this procedure.

[2] The electrical resistance offered by a regular cube of the conductor having sides 1 cm. long, is called the **specific resistance** or **resistivity** of the material and the reciprocal of this is called the **specific conductance** or **conductivity**.

[3] Such a solution contains 7.460 grams of potassium chloride in a liter for the n/10 solution and 0.7460 grams in a liter for the n/100 solution. A standardized flask should be used and the temperature of the water adjusted to correspond to that for which the flask is calibrated.

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The bridge wiring, as shown in Fig. 1, was used for part of our work, but for routine determinations the alternating current galvanometer is used together with the combined slide wire and resistance box[4]. This instrument has the advantage of using a 110 volt, 60 cycle current in place of the high frequence current necessary when the telephone is used. It possesses an added advantage in that the telephone is displaced by a galvanometer. A temperature of 25° — 0.1°C was used in all of the work.

A special dip electrode or conductivity cell was used which was similar to the ordinary Freas cell with the bottom cut off. The glass walls extended far enough below the platinum electrodes to protect them from mechanical injury. For routine mill work, however, we have found the type of dipping electrode recommended by Leeds and Northrup for use with the instrument described above to be more satisfactory.

The procedure for determining the specific conductivity of the various liquors will be given in detail. The total soda content was determined by evaporating the liquor and igniting the residue in the presence of an excess of sulphuric acid and weighing the soda as sodium sulphate. All of the figures for total soda are calculated to sodium carbonate. The data given below are taken from determinations on soda mill liquors.

The Cooking Liquors

The total soda content and specific conductivity were determined on 10 dilutions of each of 5 samples of cooking liquors, and on one dilution of each of 10 more samples of cooking liquor. This made a total of 60 points from which the curve was plotted. In all cases the dilutions were made with distilled water. These samples were taken over a period of twelve operating days. The cooking solutions were first diluted 1 to 4 and then various other

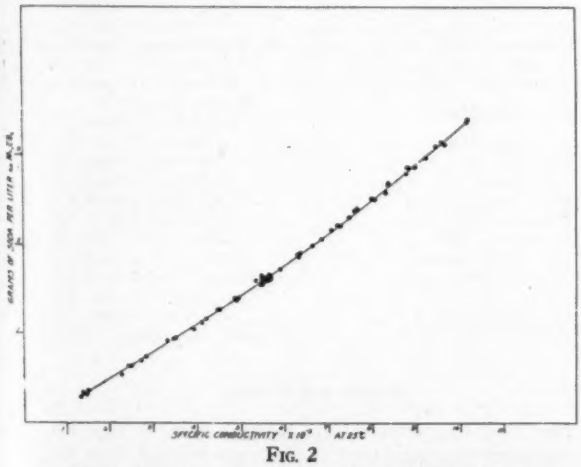

FIG. 2

The specific conductivity and total soda content of caustic cooking liquor.

dilutions made from these. The most satisfactory dilutions for routine work have been found to be those containing 2 to 4 grams of soda as sodium carbonate per liter of solution.

From the results shown in Fig. 2., it is readily seen that within limits of sampling and experimental errors all of the solutions containing the same amount of total soda have the same specific conductivity. The curve of the total soda content and the specific conductivity forms a smooth line even at the higher, as well as the lower concentrations of soda. The soda content of a liquor whose specific conductivity is known can be determined from the curve.

This particular relationship between the total soda content and the specific conductivity does not necessarily hold for any other liquor, such as a black liquor. Neither is it probable that it will hold for a cooking liquor as made in another mill. It is purely an empirical method and is based on actual soda determinations. This relationship will hold only for any particular type of liquor that, on the average, has the same electrical conductance per unit of soda. We have found this to be true for any particular type of liquor which is always prepared in the same manner.

[4] The instrument used is described in Catalog No. 48, Leeds and Northrup Company, Philadelphia, Pa.

The Black Liquor

These determinations were made on the black liquor as taken from the digesters just before the cook was blown. The total soda content is calculated as sodium carbonate and represents the total soda as determined gravimetrically. The results of these tests are

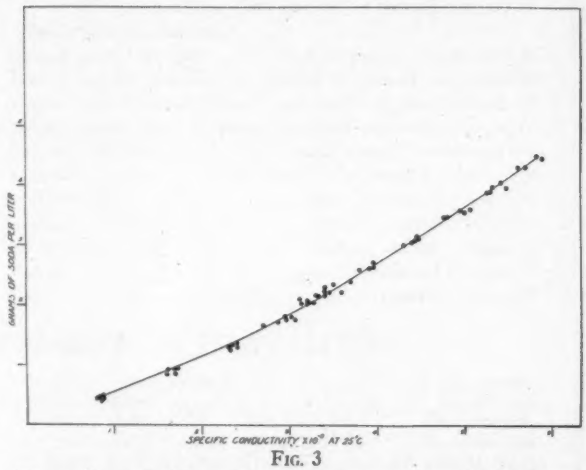

FIG. 3

The specific conductivity and total soda content of caustic black liquor.

shown graphically in Fig. 3. These samples were taken over a period of thirty-six operating days. The curve is plotted from the points obtained from fifteen different black liquors. Five of these were made up to 10 different dilutions each, making a total of 60 points. The same smooth relationship was found here as between the total soda and the specific conductivity of the cooking liquor.

When this curve is compared with the one for cooking liquor (Fig 2), it is seen that the same amount of total soda per liter of solution does not give the same electrical conductance in both cases.

The Washed Pulp

The method used to determine the total soda content of washed pulp, especially when a continuous washer is used in place of a diffuser, consists of carrying out a gravimetric soda determination on composite samples of the pulp. This is usually taken from the washer and in most cases represents the average of the best washed stock and is not a true sample of the total average soda loss. This holds true in part at least where the stock is washed in diffusers.

We have found that when the samples of stock to be analyzed for soda are taken from the washer, only about one-half to one-third of the total soda lost in the pulp is accounted for. To overcome this difficulty, we have changed the procedure somewhat by taking the samples from the stock being delivered to the screens. A sample is taken every hour, these mixed and a sample of this composite taken for analysis at the end of each hour. This gives a true value for the soda loss in the washed pulp.

The consistency of the stock is determined in the usual manner. This gives the amount of dry stock per liter and by determining the soda content of the solution the per cent of total soda lost based on the weight of dry pulp can be readily calculated.

The total soda content and the specific conductivity of the fiber-free solution were determined. These results are shown in Fig. 4. The samples were taken over a period of twelve operating days. The curve of the soda content and the specific conductivity forms

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a smooth line. The points shown represent all of the samples on which both the total soda and specific conductivity were determined.

As stated above, when using this method of determining the total soda lost in the washed pulp, it was found that two to three times as much total soda was actually lost when compared with the loss based on the soda content of the washed pulp. This is due to the fact that by this procedure all of the soda lost is measured while by the other method of sampling only the average of the well washed stock is obtained.

The Leached Carbon Sludge

The amount of soda lost in the leached carbon sludge may, in some cases, amount to several per cent of the total soda lost in the soda mill. It is rather difficult to obtain a true value for the amount of soda lost in the leached black ash except by a gravimetric determination. We have found that the specific conductivity of a filtered solution from the black ash and the total soda content of the black ash vary directly.

The total soda was determined gravimetrically. The regular procedure was modified in that the soda was not weighed as sodium sulphate, but the sulphate was precipitated and weighed as barium sulphate. This gave a value that more nearly represented the true soda content as the precipitate weighed as sodium sulphate was contaminated with iron, aluminum and silica.

The specific conductivity was determined as follows: approximately 10 grams of the ground, well mixed leached carbon sludge was weighed and placed in a 500 cc. Erlenmeyer flask together with 250 cc. of distilled water. This is boiled for 20 to 25 minutes cooled and made up to 500 cc. The carbon is filtered off and the specific conductance determined on the filtrate. The total soda-

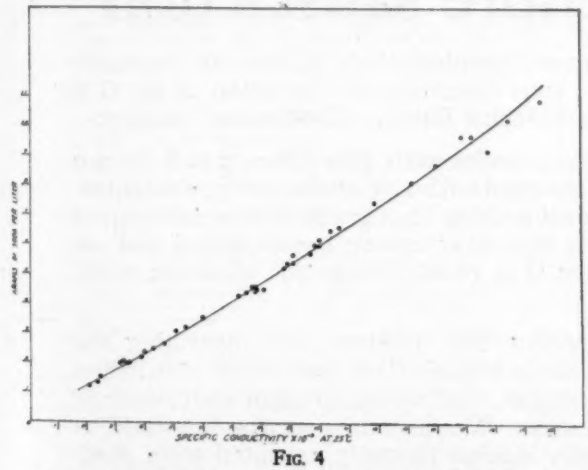

FIG. 4

The specific conductivity and total soda content of washed soda pulp.

specific conductivity ratio is shown diagrammatically in Fig. 5. These samples were taken over a period of twelve operating days. The points represent all of the determinations made. The variations of the points from the average line is not much more than is expected from sampling errors.

The investigation described above was considered to indicate conclusively that this conductance method of determining total soda is sufficiently accurate for most mill purposes. For the past four months, we have been using this method for determining soda in routine mill work. From time to time its accuracy has been checked by gravimetric determinations, the results of which are shown in Table 1. The agreement between the results of the two methods is very good.

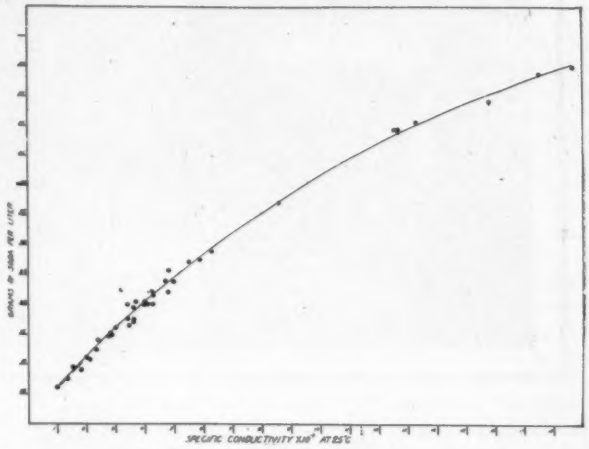

FIG. 5

The specific conductivity and total soda content of carbon sludge.

Conductivity determinations are shown to be more accurate than any other except gravimetric, and require only a few minutes work by a comparatively unskilled operator for each test.

There is no reason why automatic recording instruments connected to cells located in the various drains could not be installed for obtaining continuous records of soda losses.

A method for determining the soda content of various soda containing liquors has been described. Although it is a strictly empirical method, it is capable of producing results sufficiently accurate for all routine mill work. The time consumed for one determination is only a small fraction of that required for a gravimetric soda determination.

We have given, in detail, the procedure used for the specific conductivity method of determining the total soda in cooking liquor, black liquor, washed pulp and leached black ash. Besides these, it might be used for determining the soda losses in evaporator sumps, in various mill effluents, etc.

Conclusions

(1) It has been shown that there is a definite relation between the total soda and specific conductivity of various soda mill liquors and effluents.

(2) Specific conductivity measurements can be used satisfactorily in soda control work.

TABLE 1

THE TOTAL SODA CONTENT AS Na_2CO_3 OF VARIOUS SODA MILL LIQUORS AS DETERMINED BY THE CONDUCTIVITY METHOD, BY THE GRAVIMETRIC METHOD, AND BY TITRATION

Liquor	June 21—June 28			June 28—July 7			July 12—July 19			July 19—July 26		
	Conductivity g/l †	Gravimetric g/l	Titration * g/l	Conductivity g/l	Gravimetric g/l	Titration * g/l	Conductivity g/l	Gravimetric g/l	Titration * g/l	Conductivity g/l	Gravimetric g/l	Titration * g/l
Black liquor	2.888	2.990		3.030	3.121					2.760	2.765	
Leach liquor	2.700	2.660	2.510	2.550	2.557	2.519	2.650	2.642	2.620	2.738	2.760	2.680
Causticized leach liquor	1.750	1.825	1.775	1.760	1.808	1.760	1.800	1.805	1.752	1.750	1.760	1.758
Cooking liquor	1.242	1.260	1.223	1.230	1.250	1.207	1.250	1.261	1.235	1.235	1.225	1.237

* Sum of the various constituents as determined by titration.
† Dilutions as used for conductivity determinations.

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Pulping Flax Straw

II. Chemical Studies with Chlorine as a Pulping Agent[1]

By Earl R. Schafer[2], Mark W. Bray[3], and Clifford E. Peterson

As a part of the pulping studies of seed-flax straw now being conducted at the Forest Products Laboratory, the value of chlorine as a pulping agent is being investigated. Articles on the chlorine pulping processes have been numerous during the past two and a half years[5], and the development of the technique of handling

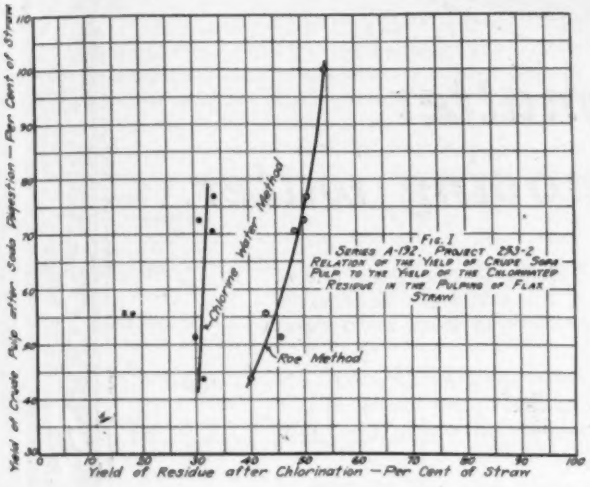

Yield of Crude Pulp after Soda Digestion — Per Cent of Straw
Yield of Residue after Chlorination — Per Cent of Straw
Chlorine Water Method
Roe Method
FIG. 1
SERIES A-192, PROJECT 283-2
RELATION OF THE YIELD OF CRUDE SODA PULP TO THE YIELD OF THE CHLORINATED RESIDUE IN THE PULPING OF FLAX STRAW

FIG. 1

chlorine in pulp production is claiming the attention of manufacturers in both Europe and America.

This paper will concern itself with the use of chlorine in conjunction with a preliminary digestion with caustic soda, and will deal with the relation of the quantities of chlorine and of caustic soda that are required for the complete pulping of flax straw and with the chemical properties of both the soda pulps and the chlorinated product.

Preparation of the Soda Pulps

No towing operation, i. e., mechanical separation of bast (long, strong fiber) from shives (woody material) was attempted in these experiments. The straw, after threshing, was dusted and cut in a rag cutter to lengths varying from one-eighth inch or less, for some of the shives, to two inches, for some of the bast fibers. Quantities of about two pounds of the cut material were digested with caustic soda in spherical cast steel autoclaves heated indirectly by steam admitted to the annular jacket. The amounts of caustic soda varied from 2 to 25 per cent of the weight of the straw. Inasmuch as the volume of cooking liquor relative to weight of straw was the same in each digestion (0.6 gallons per pound) the concentration of the chemical increased proportionately. The period of rising temperature was two hours in each cook, but the time of cooking at the maximum temperature was increased as the amount of chemical was increased in order that a maximum quantity of chemical should be consumed. The maximum temperature in each cook was 155°C. A series of pulps was thus obtained ranging from a very raw to a fairly well pulped product. A summary of the data for the soda cooks, including yields, appears in Table 1.

Chlorination of the Soda Pulps

The straw and pulps were sampled for chemical analysis and for the determination of consumption of chlorine by a gas method. The remainder of the pulps was treated with chlorine in water solution. The yields and the consumption of chlorine by the two methods used are shown in Table 1.

The chlorination of the pulps by means of chlorine gas was accomplished by a modification of the Roe method[6] for determining the bleach requirements of pulp[7].

The modified method, using samples of 2 or 3 grams of material ground to pass a 40-mesh sieve, was essentially a means of measuring the amount of chlorine consumed in a Cross and Beven analy-

[1] The first paper of this series, "Pulping Flax Straw—I. Hydrolysis with Sodium Sulphite," by M. W. Bray and C. E. Peterson, was presented before the Division of Cellulose Chemistry at the 72d meeting of the American Chemical Society, Philadelphia, Sept. 6-10, 1926. See Jr. Ind. and Eng. Chem.

[2] Associate Engineer in Forest Products, U. S. Forest Products Laboratory, Madison, Wis.

[3] Chemist in Forest Products, U. S. Forest Products Laboratory, Madison, Wis.

[4] Junior Chemist in Forest Products, U. S. Forest Products Laboratory, Madison, Wis.

[5] See bibliographies and abstracts compiled by the Committee on Abstracts of Literature of the Technical Association of the Pulp and Paper Industry.

[6] Roe, R. B., Determination of Chlorine Absorbed by Unbleached Sulphite Pulp. J. Ind. Eng. Chem. 16, 8, 808-10 (1924).

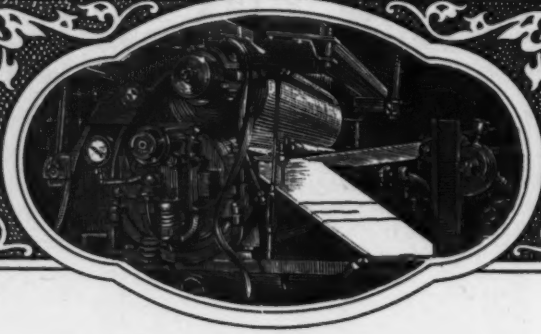
[7] Modification developed by Joseph A. Staidl, Assistant Engineer, U. S. Forest Products Laboratory, Madison, Wis.; paper presented at regional meeting of American Chemical Society, University of Wisconsin, Madison, Wis., May 29, 1926.

TABLE 1

SUMMARY OF PULPING DATA

Cook No.	Soda cooking: Caustic soda charged: Amount per 100 lb. straw.	Soda cooking: Caustic soda charged: Concentration	Soda cooking: Duration of cooking at maximum temperature.[1][2]	Soda cooking: Yield of crude pulp	Soda cooking: Caustic soda consumed: Basis amount caustic soda charged	Soda cooking: Caustic soda consumed: Basis 100 lb. straw	Chlorination by modified Roe method[4]: Yield of residue: Basis crude soda pulp	Chlorination by modified Roe method[4]: Yield of residue: Basis straw	Chlorination by modified Roe method[4]: Chlorine consumed: Basis crude soda pulp	Chlorination by modified Roe method[4]: Chlorine consumed: Basis straw	Chlorination by modified Roe method[4]: Chlorine consumed: Basis total loss in wgt. of straw	Chlorination by chlorine water method: Yield of residue: Basis crude soda pulp	Chlorination by chlorine water method: Yield of residue: Basis straw	Chlorination by chlorine water method: Chlorine consumed: Basis crude soda pulp	Chlorination by chlorine water method: Chlorine consumed: Basis straw	Chlorination by chlorine water method: Chlorine consumed: Basis total loss in wgt. of straw
	lb.	g/l.	hr.	%	%	lb.	%	%	%	%	%	%	%	%	%	%
355[3]	...	...	...	...	...	...	54.3	54.3	38.6	38.6	82.5	...	...	...	...	...
392-4	2.0	4.0	2.0	76.8	100.0	2.0	66.1	50.8	31.1[5]	23.9[5]	50.6[5]	44.0	33.8	28.8	22.1	33.4
392-5	5.0	10.0	2.0	72.5	100.0	5.0	69.3	50.3	39.6	28.7	57.8	42.7	30.9	29.7	21.5	31.1
392-6	10.0	20.0	4.5	70.5	99.4	9.9	68.7	48.5	26.3	18.6	36.1	47.3	33.4	23.3	16.4	24.6
392-1	15.0	30.0	7.0	55.6	89.0	13.4	77.5	43.1	25.3	14.1	24.8	32.9[6]	18.3[6]	23.6	13.2	15.7
392-2	20.0	40.0	9.5	51.4	81.5	16.3	88.6	45.6	9.8	5.0	9.2	58.4	30.0	12.0	6.2	8.9
392-3	25.0	50.0	12.0	43.8	74.5	18.7	93.0	40.8	6.1	2.7	4.6	71.3	31.3	7.4	3.2	4.7

[1] The period of rising temperature in each cook was 2 hours.
[2] The maximum temperature in each cook was 155 degrees C.
[3] Sample 355 was untreated, dusted, and cut straw, ground to pass a 40 meshsieve.
[4] Chlorine gas method.
[5] These values are low because of a gas leak in the apparatus.
[6] These values are low. The finished pulp appeared to be over-chlorinated,although the amount of chlorine consumed was apparently not excessive.



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sis of wood or pulp for cellulose. The detailed data for a typical determination by this method are given in Table 2.

The method of determining the chlorine consumption of the pulps by means of chlorine water consisted of alternating treatments of samples of 500 to 600 grams with cold chlorine water and hot sodium sulphite solution. The samples were not ground. The vessel used for the chlorine treatment was a butter churn of a barrel type fitted with a pulley and rotated by means of a motor. The extractions with sodium sulphite solution were made in porcelain-lined pails. The alternating treatments were repeated until the shives were thoroughly softened and pale yellow in color, after which a small amount of calcium hydrochlorite liquor was used to bleach the product. The details of a typical chlorination are recorded in Table 3.

The yields of chlorinated residue (expressed as a percentage of weight of straw) obtained by the modified Roe method varied from 54.3 from uncooked straw to 40.8 from the material prepared in Cook A-192-3, in which the largest amount of caustic soda was used. (See Table 1.) In this determination the sample was washed in an aluminum crucible and all of the material was retained except that which went into solution. In the chlorine-water method the pulp was washed, after chlorination, with a hose on a Fourdrinier wire screen, with the resulting loss of a large amount of cellular material and short-fibered particles. The yields (Table 1) were therefore lower than by the Roe method and varied only between 33.0 and 33.8 per cent. The relation between the yields of crude soda pulps and the yields of chlorinated residue is shown graphically in Fig. 1. (The anomalous point marked X is discussed in a later paragraph).

TABLE 2

CHLORINATION OF PULP A-192-5 BY THE MODIFIED ROE METHOD

Soda pulp extracted with alcohol-benzol before chlorination.

	Volume of consumed chlorine at observed temperature and pressure	Observed temperature	Observed atmospheric pressure	Volume of consumed chlorine at 0° C. and 760 mm.
	cc.	°C.	mm.	cc.
First chlorination....	252.6	29	732	211.0
Second chlorination..	91.0	30	735	76.8
Third chlorination(a)	25.0	34	737	20.4
Total chlorine consumed				308.2

Solubility of crude pulp in alcohol-benzol	1.5 per cent
Weight of extracted sample taken (oven-dry)	2.4314 grams
Weight of total chlorine consumed	0.9765 grams
Weight of chlorinated residue (oven-dry)	1.7120 grams
Yield (unextracted pulp basis)	69.3 per cent
Chlorine consumed (unextracted pulp basis)	39.6 per cent

The chlorine consumption determined by the Roe method was found to be nearly equal to that determined by the chlorine water method in all cases in which the straw had been cooked with 10 per cent or more of caustic soda. The pulps from cooks that had

(a) The chlorine treatments were alternated with treatments with a hot 2 per cent solution of sodium sulphite until the sample ceased to show a pink coloration upon addition of the latter.

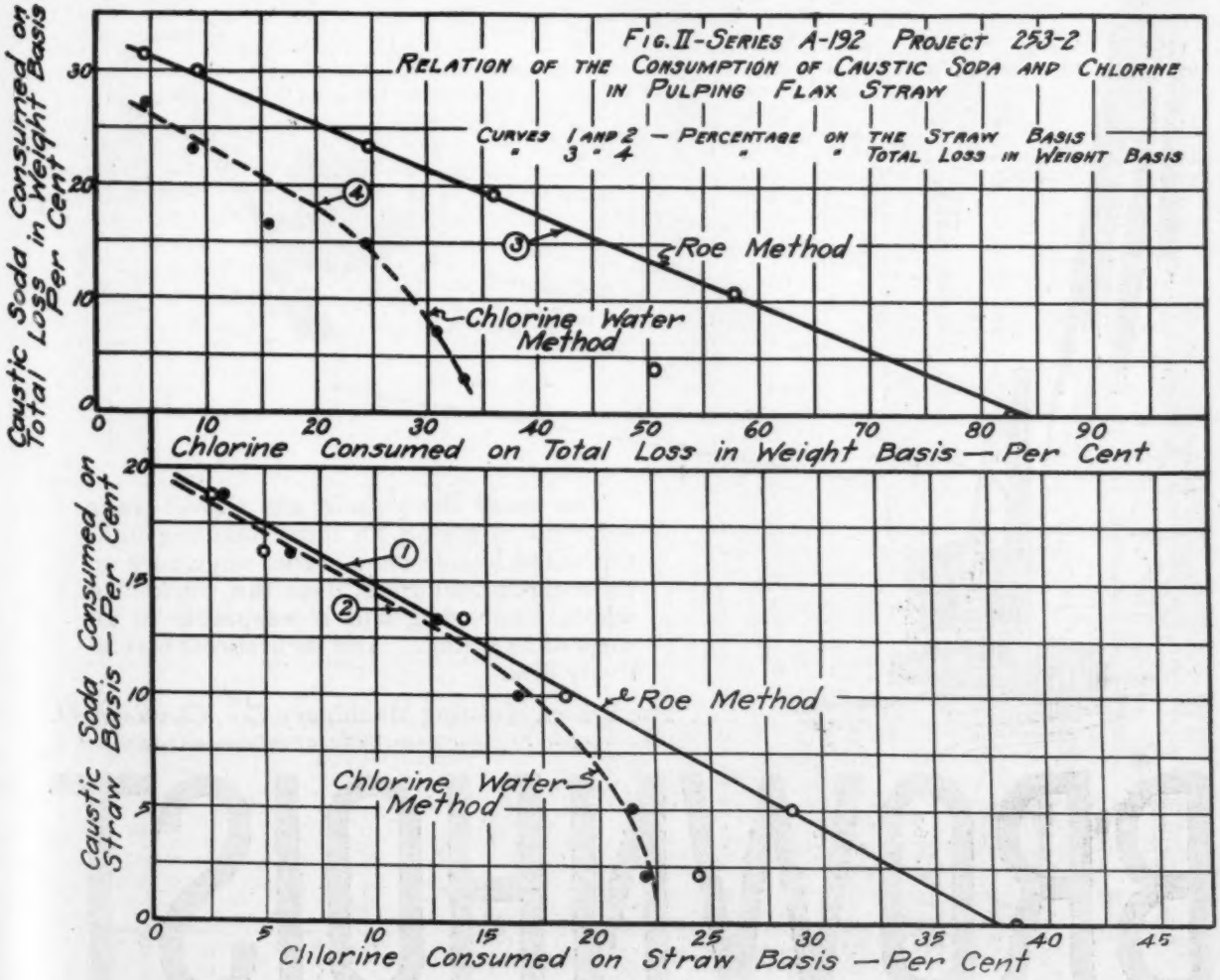
FIG. II-SERIES A-192 PROJECT 253-2
RELATION OF THE CONSUMPTION OF CAUSTIC SODA AND CHLORINE IN PULPING FLAX STRAW
CURVES 1 AND 2 — PERCENTAGE ON THE STRAW BASIS
" 3 " 4 " " TOTAL LOSS IN WEIGHT BASIS
Roe Method
Chlorine Water Method
Caustic Soda Consumed on Total Loss in Weight Basis Per Cent
Chlorine Consumed on Total Loss in Weight Basis — Per Cent
Caustic Soda Consumed on Straw Basis — Per Cent
Chlorine Consumed on Straw Basis — Per Cent

FIG. 2

"We made no mistake in purchasing this machine"

Illinois Northern Utilities Company

GENERAL OFFICES

DIXON, ILLINOIS

November, 16, 1926

The Brown Hoisting Machinery Co.,
1403 St. Clair Ave.,
Cleveland, Ohio

Gentlemen:

Your letter of inquiry as to our satisfaction with our No.1 Brownhoist after four months usage is at hand, and we wish to thank you for your interest in the matter.

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Since we have put it into operation, it has not only been regularly used for unloading coal from cars, stocking and recovering coal and coke, loading cars of coke, and shifting cars about the yard, but has extensively been used in construction of our new Gas Plant.

It has been used for excavating for our new 500,000 cu. ft. holder and for the foundations of the other units in the plant, for backfilling, unloading concrete aggregates erecting machinery, as a pile driver, and has at times been subject to a 100% overload over its rated capacity, with no trouble other than snapping of a few strands of hoisting cable.

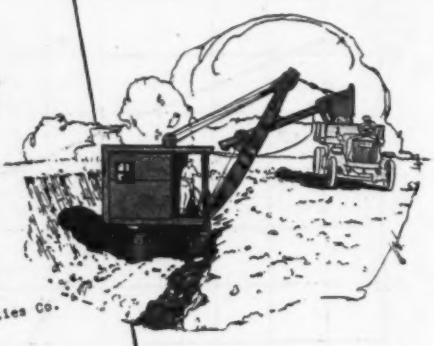
We are convinced that we made no mistake in the purchase of this type or make of a machine.

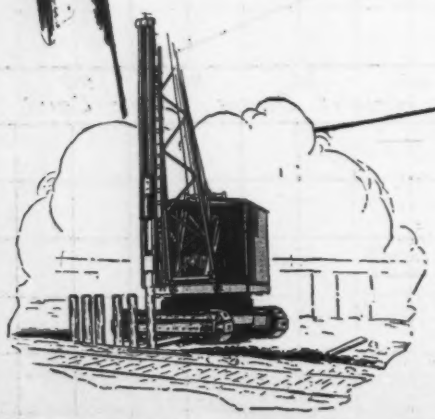
Yours very truly,

L. G. Adams

Gas Eng.

Illinois Northern Utilities Co.





The small Brownhoist gas shovel-crane referred to makes an ideal handling unit. Operated by one man, it goes anywhere on its creeper mounting, does the work of a whole labor gang and is adaptable to all sorts of handling. And its first cost is relatively low.

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TABLE 3

CHLORINE WATER TREATMENT OF PULP A-192-5

Step No.		Chlorine consumed	Sodium sulphite used
		Grams	Grams
	Crude pulp at 92.5 per cent dryness—525 grams (oven-dry weight)—was treated with:		
1.	18.9 liters chlorine water at 3.50 grams per liter and 3.8 liters at 3.98 grams per liter. Chlorine exhausted in 12 hours	81.4	
2.	7.5 liters of sodium sulphite solution at 14.0 grams per liter. Heated to boiling for 1 hour		105.0
3.	7.6 liters chlorine water at 3.26 grams per liter—chlorine exhausted	24.8	
4.	Sodium sulphite solution as in (2)		105.0
5.	3.8 liters chlorine water at 3.26 grams per liter and 3.8 liters of water. Chlorine exhausted in 2.5 hours	12.4	
6.	7.5 liters of sodium sulphite solution at 3.47 grams per liter. Heated to boiling for 1 hour		26.0
7.	3.8 liters chlorine water at 3.26 grams per liter and 3.8 liters of water. Chlorine exhausted in 18 hours	12.4	
8.	Sodium sulphite solution as in (6)		26.0
9.	3.8 liters chlorine water at 2.55 grams per liter and 3.8 liters of water. Chlorine exhausted in 18 hours	9.7	
10.	Sodium sulphite solution as in (6)		26.0
11.	3.8 liters chlorine water at 2.26 grams per liter and 3.8 liters of water. Chlorine exhausted in 24 hours	8.6	
12.	Sodium sulphite solution as in (6)		26.0
	After beating a few minutes in a "baby" beater to cut the shives, the sample was treated with:		
13.	200 cc. of bleaching liquor at strength of 9.5 per cent bleaching powder containing 35 per cent available chlorine	6.7	

The residual pulp when oven-dried weighed 224 grams.

Chlorine (crude pulp basis) as chlorine water	28.4 per cent
Chlorine (crude pulp basis) as bleaching powder	1.3 per cent
Total chlorine consumed (crude pulp basis)	29.7 per cent
Total chlorine consumed (straw basis)	21.5 per cent
Sodium sulphite used (crude pulp basis)	59.8 per cent
Sodium sulphite used (straw basis)	43.3 per cent
Yield of residue (crude pulp basis)	42.7 per cent
Yield of residue (straw basis)	30.9 per cent

received milder treatment during the soda digestion required less chlorine as chlorine water than as gas. The difference may be explained as a result of loss of material in the chlorine water method. The pulps obtained by mild digestion required more alternate chlorine and sulphite treatments than those digested with larger amounts of caustic soda. The frequent washing necessary caused a large mechanical loss of the very small gelatinous fibers before they had been completely chlorinated. If this material had not been lost it is believed the chlorine consumption by the two methods would have been the same.

Figs. 2 and 3 show that there is a straight-line relation between the caustic soda consumption and the chlorine requirement, an increase in the former being accompanied by a proportionate decrease in the latter. In Fig. 3 the relation is shown on a chemical equivalent basis by a diagram drawn to the same coordinates used by Strachan[8] in an investigation of the pulping of wheat straw by the DeVains process. Strachan concluded from the diagram which he obtained that there were limits within which one molecule of caustic soda was interchangeable with one atom of chlorine. While under the conditions of the present experiments there is a definite chlorine requirement for a given consumption of caustic soda, the slope of the curve in Fig. 3 shows that limits within which one atom of chlorine will do the work of one molecule of caustic soda do not exist for flax straw.

Analysis of the Pulps

The chemical properties of the pulps were determined both before and after the chlorine water treatment. The residues obtained from the Roe method were too small for satisfactory analysis. Lignin was determined by a modification of the method of Ost and Wilkening[9] and copper number by a slight modification of the method reported by Staud and Gray[10]. Determinations of cellulose, total pentosans, pentosans in the cellulose, and solubility in 1 per cent

[8] Strachan, J., DeVains Process Explained, Paper 35, 1, 2, Oct. 23, 1924.
[9] Ost and Wilkening, "Cross and Bevan Researches on Cellulose," 3, 39 (1905-1910), Chemiker Zeitung 461 (1910).
[10] Staud, C. J., and Gray, H. LeB., J. Ind. and Eng. Chem. 17, 741 (1925).

TABLE 4

ANALYTICAL DATA ON PULP FROM FLAX STRAW COOKED WITH SODIUM HYDROXIDE

Sample No.	Cook No.	Quantities based on oven-dry weight of straw: Yield of crude pulp	Lignin	Cellulose: Total	Cellulose: Pentosan-free	Pentosans: Total	Pentosans: In cellulose	Pentosans: Not in cellulose	Quantities based on oven-dry weight of pulp: Cellulose	Sum of pentosan-free cellulose, lignin, and total pentosans	Copper number	Soluble in 1% NaOH solution.
		%	%	%	%	%	%	%	%	%		%
355		100.0	24.7	52.3	45.4	16.3	6.9	9.4	52.3	86.5	..	33.5
359	A-192-4	76.8	22.6	51.1	43.3	10.9	7.8	3.1	66.5	100.1	6.2	13.6
360	A-192-5	72.5	19.9	50.3	42.1	10.5	8.2	2.3	69.4	100.0	4.3	11.8
361	A-192-6	70.5	19.2	48.8	40.9	10.1	7.9	2.2	69.2	99.6	4.2	9.8
356	A-192-1	55.6	11.3	41.8	35.3	8.0	6.5	1.5	75.2	98.2	4.0	10.6
357	A-192-2	51.4	6.2	44.2	37.4	7.4	6.8	0.6	86.0	99.4	3.7	8.6
358	A-192-3	43.8	2.4	39.6	34.6	5.5	5.0	0.5	90.3	97.0	2.4	7.9

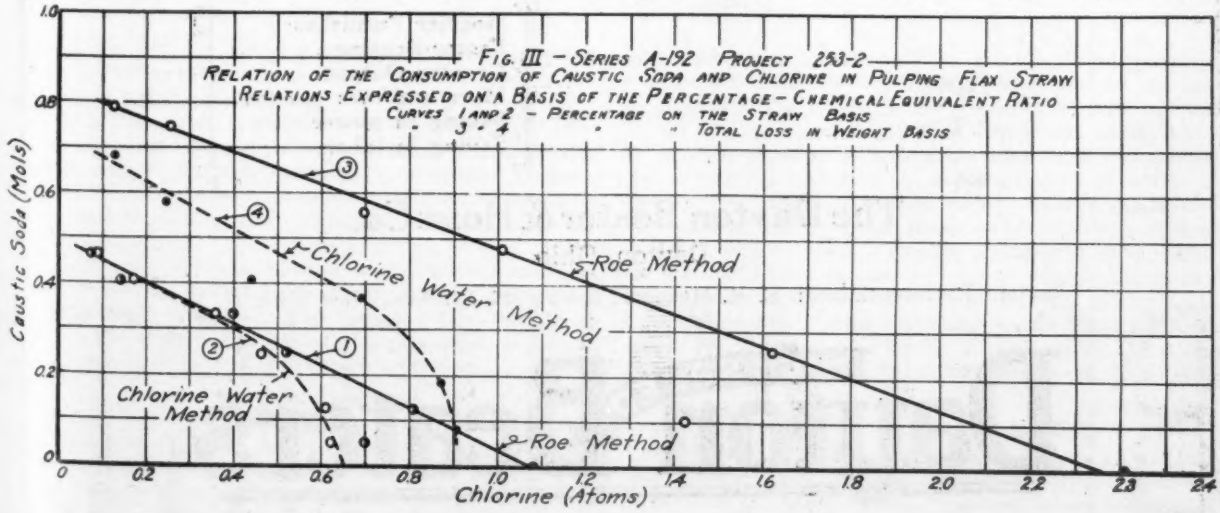

FIG. 3

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TABLE 5

ANALYTICAL DATA ON FLAX SODA PULPS CHLOKINATED WITH CHLORINE WATER

Sample No.	Soda cook No.	Quantities based on oven-dry weight of straw: Yield of residue %	Lignin %	Cellulose: Total %	Cellulose: Pentosan free %	Pentosans: Total %	Pentosans: In cellulose %	Pentosans: Not in cellulose %	Quantities based on oven-dry weight of chlorinated pulp: Cellulose %	Copper number	Soluble in 1% NaOH %
365	A-192-4	33.8	0.8	32.8	29.5	3.7	3.3	0.4	97.0	4.0	12.7
366	A-192-5	30.9	0.9	29.8	27.3	3.1	2.5	0.6	96.2	4.3	15.1
367	A-192-6	33.4	0.7	32.4	28.8	4.4	3.6	0.8	97.0	2.4	9.6
362	A-192-1	18.3	0.3	15.7	15.1	1.1	0.6	0.5	85.7	19.3	33.2
363	A-192-2	30.0	0.4	29.5	25.7	4.0	3.8	0.2	98.5	2.3	8.5
364	A-192-3	31.3	0.9	30.6	27.2	3.7	3.4	0.3	97.7	3.9	11.3

sodium hydroxide solution were made according to methods reported by Schorger[11]. The results of the chemical analyses are shown in Tables 4 and 5.

In the case of the crude soda pulps, an increase in the amount of caustic soda and in the length of the cooking period results in a greater purity of product, as is shown by an increase in the content of cellulose and by a lowering of the copper number and of the solubility in 1 per cent caustic soda. At the same time there is a marked disintegration of the pentosan-free cellulose and of the pentosans not in the cellulose. That the latter are removed even more readily than lignin is shown by the data for sample No. 359 (Table 4), which was treated with a very dilute solution of sodium hydroxide for a short period of time. On the other hand the pentosans in the cellulose appear to be exceedingly stable toward the reaction.

Treatment With Chlorine Water

Treatment of the crude soda pulp with chlorine water results in an increase in cellulose content and a decrease in lignin content, in copper number, and in alkali-solubility. Regardless of the relative proportions of caustic soda and chlorine used in their preparation, the pulps finally obtained in all cases (except that of sample No. 362, noted below) manifested practically identical chemical properties in so far as can be determined by the analysis made.

Sample No. 362 was abnormally low in cellulose and abnormally high in both copper number and solubility in 1 per cent caustic soda solution. The pulp possessed the properties characteristic of an ever-chlorinated product[12] although the quantity of chlorine consumed was not excessive. The peculiar properties of the pulp must, therefore, be ascribed to some conditions (probably age and acidity of the chlorine water) not recognized at the time of the experiment.

Summary

A study has been made of the amounts of chlorine required to complete the pulping of flax straw digested with various amounts of caustic soda.

It has been shown that under a wide variety of conditions as regards the amounts of chemicals and the duration of the cooking periods there is a linear decrease in the amount of chlorine consumed as the caustic soda consumption increases. The investigation has not revealed limits of consumption of caustic soda and chlorine such as those reported by Strachan for wheat straw, within which one molecule of caustic soda is interchangeable with one atom of chlorine.

As might be expected, a chemical analysis of the pulps shows an increase in the purity of the soda pulp as the amount of chemical and time of digestion were increased. The higher degrees of purity were accompanied, however, by greater losses of cellulose.

It was found that chlorination increased the purity of the pulp, as evidenced not only by an increase in the cellulose and a decrease in the lignin content but also by a reduction of the copper number and of the solubility in 1 per cent caustic soda solution.

[11] Schorger, A. W., J. Ind. and Eng. Chem. 9, 556 (1917).

[12] See Bray, M. W., and Andrews, T. M., Paper Trade J. 76, 8, Feb. 22, 1923.

Report of Paper Testing Committee

By B. W. Scribner, Chairman

During the year the following twenty-one methods proposed by the committee have been adopted by the association as its official paper testing methods.

Sampling, atmospheric conditions, fiber composition, ream weight, thickness, bursting strength, tensile strength, tearing strength, machine direction, qualitative determination of rosin, starch, nitrogen, and casein; quantitative determination of casein coating, paraffin, resin, starch, nitrogen, moisture, ash, and active sulphur.

The following additional methods are being formulated by the committee and will probably be submitted to the association in the near future; time of ink absorption of blotting paper, time of water absorption of bibulous papers, analysis of mineral coating, analysis of mineral filler, folding endurance.

Meeting of the Committee

A meeting of the committee was held at the Bureau of Standards, September 17, 1926. Thirteen members of the committee and the secretary of the association, W. G. MacNaughton, were present. The methods being formulated by the committee were reviewed and further work planned. The committee had hitherto been dealing with methods outlined by previous committees and published several years previous by the association, therefore they were regarded as tentative methods and the present committee simply rewrote them in more definitely specified form and proposed them to the association for immediate adoption. It was decided that additional methods not having this status should be proposed, whenever formulated, for adoption by the association as tentative methods to be considered at the expiration of one year for adoption as official methods. It was also decided that in dealing with such methods, a two-thirds majority of those voting be required in the committee for approval of a method but that the present rule of the majority vote by the association members as a whole be retained. Considerable time was given to discussion of methods desirable for development. It was agreed that there was need for the following methods and that they should be listed as subjects for co-operative development research:

Subjects For Co-operative Research

Adherence of mineral coating, grease resistance of wrapping papers, ink resistance of printing papers, opacity, count of dirt particles in fine papers, fiber composition, water resistance of water proof papers, bulk quantitative determination of small amounts of paraffine, gloss, wet-rub resistance, erasing quality, degree of internal sizing and stiffness.

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Work in Progress

Of the methods mentioned, subcommittees have been appointed by the chairman to deal with the following and active research on them is in progress:

Adherence of Mineral Coating, R. H. Savage Chairman,

Grease Resistance of Wrapping Papers, H. A. Smith, Chairman,

Ink Resistance of Printing Papers, E. O. Reed, Chairman.

Count of Dirt Particles in Fine Papers, H. L. Peckham, Chairman,

Opacity, T. C. Bentzen, Chairman,

Fiber Composition, C. E. Libby, Chairman.

The other subjects mentioned will be dealt with in the same manner as these, as soon as feasible.

General Developments in Paper Testing

The American Society for Testing Materials has a subcommittee working actively on formulation of methods for testing electrical insulating papers. The subjects being dealt with are folding endurance, air resistance, absorbency, thickness, and conducting particles. The Paper Testing Committee, (TAPPI) is keeping closely in touch with this work, its chairman acting as an advisory member of the American Society for Testing Materials sub-committee.

A very interesting and instructive paper entitled "Annular-Oblique Illumination for the Microscopy of Surface Texture" (Paper Trade Journal, October 14, 1926) was presented by Lloyd A Jones of the Eastman Kodak Company at the Fall Meeting of the TAPPI. This is an important contribution to the technique of photomicrography of the character of surface of paper and like fabrics. An article by Korn, "Methods of Distinguishing Sulphite and Soda Celluloses in Paper" (Papier-Fabr., 1925, 23, 781) gives the results of further investigation of this subject. Alexander's method is found by him to be unreliable. C. G. Bright's article, "Preparations of Slides for Micro-Chemical Paper Fiber Analysis" (Paper Makers Monthly Journal, August 16, 1926) as a further contribution to the technique of fiber micro-analysis by the originator of the excellent method for differentiating between bleached and unbleached fibers.

A new penduium type of tearing tester, designed to tear one sheet at a time, was described in PAPER TRADE JOURNAL, December 23, 1926, by C. F. Sammet. The following three papers presented at the previous annual meeting of the association were published in full in Technical Association Papers, Series IX, No. 1, June, 1926:

"Durability of Paper," by Gosta Hall.

"A Study of the Eastman Colorimeter for Determining the Color of Paper," by H. L. Peckham and Walter Brecht,

" An Air Conditioned Testing Cabinet," by F. T. Carson.

An article entitled, "Paper Research of the United States Bureau of Standards During 1926," published in PAPER TRADE JOURNAL, December 9, 1926, describes in brief detail the various researches of this bureau on standardization of paper testing methods. The most important Bureau contribution during the year is Technologic Paper, No. 326, "Measurement of the Degree of Sizing of Paper," by F. T. Carson, which gives the results of work on this problem extending over several years. This publication is an excellent basis for standardization of this important test method as it discusses all known methods proposed for this purpose, including two developed by the bureau. Included in the work on physical testing are the development of an instrument for measuring the wet-rub resistance, the obtaining of additional data on comparison of results obtained with different types of tensile strength testers, further study towards elimination of sources of errors in the Mullen tester, and research on various problems connected with determination of folding endurance. It is stated that results obtained in continued use of the opacity tester developed by the bureau show that this is a very accurate and practical means of measuring the opacity of paper. An air-conditioned testing cabinet developed by the bureau was described by F. T. Carson at the previous annual meeting of the association. A recent development at the bureau is an extensometer for measuring the expansion of paper boards. Study is being made of the "dot" method of counting paper fibers which is suggested for consideration in the association official method for determination of fiber composition of paper The results so far obtained indicate that this method assists materially in obtaining accuracy. This bureau is cooperating to every extent possible in the TAPPI work on its establishment of official testing methods as it fully realizes the value of this work in assisting to establish standard testing procedure.

I wish to acknowledge the hearty cooperation given by members of the committee and members of the association in general. The committee has been materially assisted in its work by the many constructive criticisms received with the mail ballots during the course of the association voting on the methods. These have frequently led to needed changes in the methods and in all cases are carefully recorded for future reference.

No papers will be presented at the sectional meeting on paper testing. Instead, the entire time will be given to an informal discussion of the additional methods being considered by the committee, as listed above.

NEW ADVISOR TO PINE INSTITUTE

Dr. Austin Cary, of the United States Forest Service, officially titled logging engineer, but known throughout the South as the dean of turpentine pine scientists, has been elected to membership in the Forestry Advisory Council of Pine Institute of America.

This council is a self-governing body, articulated with Pine Institute, and composed of foresters of outstanding rank and ability. Dr. Cary is the first forester outside of the State foresters of the South to be honored by election to the Forestry Advisory Council.

"When Colonel Bunker, of Alabama, nominated Dr. Cary, and the members of the Forestry Advisory Council elected him to membership in their body, a most valuable addition was made to the council," said O. H. L. Wernicke, president of the Institute. "Pine Institute has, of course, steadily profited from Dr. Cary's wisdom and constructive counsel from the first. He was the first member of the U. S. Forest Service to take a personal membership in Pine Institute, and has taken great interest in its affairs. He, with Dr. Eloise Gerry, and one or two others originated the plan which ultimated in the PIA regional conferences. Over many years Austin Cary has proved himself one of the great practical foresters of the nation."

APPLIED X-RAYS

Applied X-Rays. By George L. Clark, assistant professor of applied chemical research in the Massachusetts Institute of Technology. McGraw-Hill Book Company, Inc., New York. 255pp. Price $4.

In "Applied X-Rays" Professor Clark has presented for the first time the science and technique of X-rays as pertaining to the work of the research chemist and engineer. Part I outlines the fundamental science of X-rays; Part II describes effects and applications of X-rays; and Part III shows how X rays can be used in the ultimate analysis of materials. Parts I and II are excellent critical surveys of the general literature and will provide the necessary grounding for the specialized technique of the structural studies, in which the author has proved himself to be an authority. Part III considers the following subjects: crystals and X-ray diffraction; the experimental methods of crystal analysis; crystal analysis of elements and inorganic compounds; crystal structures of carbon compounds; qualitative and quantitative analysis by X-rays; relations between structure and the fundamental properties of crystals; X-rays in the study of colloidal and amorphous structure; X-ray diffraction methods in metallurgy.

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Bibliography of Papermaking for 1926

TAPPI Committee on Abstracts and Bibliography, Contribution No. 49

By Clarence J. West, Chairman, and A. Papineau-Couture.

List of Journals Covered

For more complete information about most of the following journals, as well as a list of the libraries in the United States and Canada in which they are currently received, see the List of Periodicals abstracted by Chemical Abstracts with Key to Library Files, published by Chemical Abstracts in 1926.

American Dyestuff Reporter. Howes Publishing Company, 90 William Street, New York City.

Annalen der Chemie, Justus Liebig's. Verlag Chemie, G. m. b. H., Leipzig, Germany.

Annalesacademiae scientiarum Fennicae. Suomalaisen Tiedeakatemian Kustantama, Helsingfors, Finland.

Biochemical Journal. Cambridge University Press, London, E. C. 4, England.

Biochemische Zeitschrift. Julius Springer, Berlin, W. 9, Germany.

Bollettino R. stazione sperimentale per l'industria della carta e lo studio delle fibre tessili vegetali. Milan, Italy.

Bulletin of the Imperial Institute. The Imperial Institute, London, S. W. 7, England.

Bumazhnaya Promuishlennost (Paper Industry). Printed in Russian. Moscow, Union of the Socialistic Soviet Republic.

Caoutchouc et la gutta-percha. A. D. Cillard, Paris, France.

Cellulose Industry (Journal of the Cellulose Institute, Tokyo). Printed in Japanese with English and German summaries. Mitsubishi Paper Mills, Ltd., Hongo-Ku, Tokyo, Japan.

Cellulosechemie. Supplement to the Papier-Fabrikant.

Chemical and Metallurgical Engineering. McGraw-Hill Company, Inc., New York City.

Chemiker-Zeitung. Walter Roth, Cöthen, Germany.

Chimie et Industrie. Société de Chimie Industrielle, Paris, France.

Dyestuffs. National Aniline and Chemical Co., New York City.

Engineering. 35 Bedford Street, Strand, London, W. C. 2, England.

Foundry. Penton Publishing Company, Cleveland, Ohio.

Génie Civil. 6 rue de la Chaussée d'Antin, Paris, France.

Giornale di chimica Industriale ed Applicata. Via S. Paolo 10, Milan, Italy.

Helvetica Chimica Acta. Georg & Co., Basel, Switzerland.

India Rubber Journal, 37 Shoe Lane, Fleet Street, London, E. C., London.

Industrial and Engineering Chemistry. Mills Building, Washington, D. C.

Journal of the American Institute of Electrical Engineers. 33 W. 39th St., New York City.

Journal of Physical Chemistry. Baker Laboratory, Ithaca, New York.

Journal of Scientific Instruments. Cambridge University Press, London, E. C. 4, Eng.

Journal of the Society of Chemical Industry. London, E. C. 2, England.

Journal of the Textile Institute. Manchester, England.

Kolloid-Zeitschrift. Theodor Steinkopff, Dresden-Blasewitz, Germany.

Making Paper. Crown-Willamette Paper Company, Portland, Ore.

Malayan Agricultural Journal. The Secretary for Agriculture, S. S. & F. M. S., Kuala Lumour.

Mechanical Engineering. 29 West 39th street, New York City.

Mitteilungen aus dem Materialprufungsamt und dem Kaiser Wilhelm-Institut fur metallforschung zu Berlin-Dahlem. Julius Springer, Berlin, W. 9, Germany.

Monatshefe fur Chemie und verwandte Teile anderer Wissenschaften. Hölder-Pichler-Tempsky, A.-G., Vienna, Austria.

Moniteur de la papeterie française. 154 Blvd. Haussmann, Paris, France.

Naturwissenschaften. Julius Springer, Berlin, Germany.

Paper Industry. 356 Monadnock Bldg., Chicago.

Paper Maker and British Paper Trade Journal. 47 Cannon St., London, E. C., 4, England.

Paper Makers' Monthly Journal. Merchant Singer & Co., London, E. C. 3, England.

Paper Making. 1 Mitre Court, Fleet St., London, E. C. 4, England.

Paper Mill. 154 Nassua St., New York City.

Paper Makers' Monthly Journal. Marchant Singer & Co., York City.

Papeterie. Lhomme et Argy, Paris, France.

Papier. Edouard Henry, Paris, France.

Papier-Fabrikant. Otto Elsner, Berlin, Germany.

Papier-Zeitung. Berlin S. W. 11, Germany.

Pappen und Holzstoff-Zeitung. Dresden, Germany.

Papir-Journalen. Papirindustriens Hus, Huitfeldtsgt. 1, Oslo, Norway.

Pappers—och Travarutidskrift för Finland; Suomen Paperi— ja Puutavaralehti. (The Finnish Paper and Timber Journal). Helsingsfor, Finland.

Pulp and Paper Magazine of Canada. Garden City Press, Gardenvale, P. Q., Canada.

Super-Calender. Pusey and Jones Co., Wilmington, Del.

Svensk Kemish Tidskrift. Stockholm, Sweden.

Svensk Pappers-Tidning. Stockholm, Sweden.

Technical Association Papers. TAPPI, New York City.

Teer. Wilhelm Knapp, Halle, Germany.

Teknisk Tidskrift. Stockholm, Sweden.

Wochenblatt fur Papierfabrikationen. Güntter Staib, Wurttemberg, Germany.

World's Paper Trade Review. Stohehill and Gillis, London, E. C. 4, England.

Zeitschrift fur angewandte Chemie. Verlag Chemie, Leipzig, Germany.

Zeitschrift fur Elektrochemie. Verlag. Chemie, Leipzig, Germany.

Zellstoff und Papier. Verlag Carl Hoffmann, Berlin, S. W. 11, Germany.

Classifications

The papermaking literature of the year is arranged under the following topics:

Analytical
Bamboo
Barkers
Beating
Bibliography
Black Liquor
Bleaching
Boards
Cellulose
Cellulose-Analytical
Chips
Chlorine process
Clays
Coating materials, Coated papers
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  Pulp, reddening of
  Waste liquors
Trade
Washing pulp
Waste
Waste paper
  Water
White water
Wires
Miscellaneous

Analytical

Cook, O. L. Report on methods for testing chemical lime. Paper Trade J. 82, no. 11:54-55 (Mar. 18, 1926); Tech. Assoc. Papers 9:112-113 (1926); T. S. 83:120.

Dieckmann, R. Control of operations in the pulp mill. Papierfabr. 23, no. 20:317-320; no. 21:333-336; no. 22:353-357 (May 17-31, 1925); abstr. in Paper Ind. 7, no. 10:1606-1607 (Jan., 1926); T. S. 83:84; C. A. 20:1323; 19:2563.

Holtan, E. Chemical control in the manufacture of paper. Papir-Journ. 14, no. 1:5-8; no. 2:17-23 (Jan. 23, Feb. 11, 1926); C. A. 20: 1516.

Oeman, E. Indicators for the pulp industry. Svensk Pappers-Tid. 1925: nos. 9-11; Papierfabr. 24, no. 18:267-70; no. 19:285-288; no. 20: 299-303 (May 2-16, 1926); C. A. 19:2743.

Stevens, R. H., and **Abrams, A. J.** Lime sludge analysis. Paper Trade J. 82, no. 8:243 (Feb. 25, 1926); Paper Ind. 7, no. 12:2001 (Mar., 1926); T. S. 83:10; C. A. 20:1522.

Bamboo

Azami, K., and **Sengoku, S.** Constituents of bamboo. Cellulose Ind. Tokyo 1:157-161 (1925); C. A. 20:2248.

Bamboo pulp achievement. World's Paper Trade Rev. 86, no. 13:946 (Sept. 24, 1926).

Bamboos from Malaya for paper making. Bull. Imp. Inst. 24, no. 2: 219-221 (1926); C. A. 20.3811; T. S. 83:224.

Fester, G., and **Mardana, G.** Use of bamboo for pulp. Z. angew. Chem. 39:75 (1926).

Mayo, J. G. Use of bamboo for pulp and paper making. Paper Trade J. 82, no. 13:34-38 (Apr. 1, 1926); C. A. 20:2071; T. S. 83.92.

Raitt, W. Bamboo. World's Paper Trade Rev. 85, no. 19:1460, 1462 (May 7, 1926).

Ravizza, V. Bamboo as a material for paper making. Boll. staz. sper. ind. carta 4, no. 12:109-118 (Dec., 1925); Pulp Paper Mag. 24, no. 30:889 (July 29, 1927); Wochbl. Papierfabr. 57, no. 16:447-449 (Apr. 17, 1926). 68 references.

Barkers

Barking Slabs. TAPPI Special Reports 1:85-87 (1926).

Hoyer, Fritz. New method for barking wood. Svensk Pappers-Tid. 28, no. 15:393-395 (Aug. 15, 1926).

Ryland, C. G., and **Lauriault, W .E.** Care of barker and chipper knives. Pulp Paper Mag. 24, no. 11:302 (Mar. 18, 1926); T. S. 83: 120a.

Thorne barker. Wochbl. Papierfabr. 57, no. 45:1249-1250 (Nov. 6, 1926).

Beating

Beating tester—Schopper-Riegler system patented. Paper Trade J. 82, no. 1:53 (Jan. 7, 1926); T. S. 83:44.

Bennett, B. W. Beaters and superintendents. Paper Mill 49, no. 42:18, 36 (Oct. 16, 1926).

Clapperton, R. H., and **Henderson, Wm.** Beating. World's Paper Trade Rev. 85:1380, 1382, 1384 (Apr. 30, 1926); Paper Trade J. 83, no. 1:56-57 (July 1, 1926); T. S. 83:144; C. A. 20.3082.

Davis, D. S. Freeness testing as a measure of beating performance. Ind. Eng. Chem. 18:631-633 (1926); Pulp Paper Mag. 24, no. 34:987-988 (Aug. 26, 1926); C. A. 20:3808; T. S. 83:144, 240.

Dubreuil, P. Construction of papermaking equipment in France: a new beater. Papier 28:1307-1312 (Dec. 1925); T. S. 83:111.

Efficiency of a jordan. TAPPI Special Reports 1:102-103 (1926).

(Explosion of beater roll). Paper Mill 49, no. 47:8 (Nov. 20, 1926).

Fox, C. J. J. Hydration of cellulose. Paper Maker 71:366-366a (1926); World's Paper Trade Rev. 85:1060, 1062 (1926); Paper Makers' Mo. J. 64:140-141 (1926); C. A. 20:2069; T. S. 83:110.

Guild, E. J., and **Mills, S.** Hydration of cellulose. World's Paper Trade Rev. 85, no. 5:334, 336, 338 (Jan. 29, 1926); discussion by Cottrall, no. 6:426, 428, 430, 468, 470, 472 (Feb. 5, 1926); by Fox, no. 14:1060, 1062 (Apr. 2, 1926).

Hauser, A. Practical beater construction.. Wochbl. Papierfabr. 57, no. 11:295-296 (Mar. 13, 1926); T. S. 83:111.

MacNaughton, W. G. Beating. Making Paper 8, no. 8:277-279 (Feb., 1926); Zellstoff u. Papier 6, no. 4:169 (Apr., 1926); Paper Making 45, no. 6:230-231 (June, 1926); T. S. 83:44.

Mallichk, H. Beater efficiency. Wochbl. Papierfabr. 57, no. 12:338-341 (Mar. 20, 1926); T. S. 83:111.

Marx, R. Beating house problems. World's Paper Trade Rev. 86, no. 25:1908, 1910, 1912, 1914 (Dec. 17, 1926).

Micoud, H. Reducing power consumption in beating. Papier 29:401-408 (Apr., 1926); T. S. 83:111.

Mowatt, J. H. Mechanical pulp and its physical property of wetness. Paper Maker 71, no. 1:59-61 (Jan., 1926); World's Paper Trade Rev. 84:1988-1996 (1925); C. A. 20:1322; T. S. 83:44.

Pneumatic beater bedplate. Paper Trade J. 83, no. 22:47 (Nov. 25, 1926).

Rue, J. D., and **Wells, S. D.** The rod mill in the pulp and paper industry. Paper Trade J. 83, no. 12:53-54 (Sept. 16, 1926); Paper Mill 49, no. 38:14, 16 (Sept. 18, 1926); Pulp Paper Mag. 24, no. 40: 1192 (Oct. 7, 1926); Zellstoff u. Papier 6, No. 12: 514-515 (Dec., 1926); T. S. 83: 240.

Schwalbe, G. G. Degree of swelling and of beating. Paper Maker 71, No. 6: 593, 595, 597, 599 (June, 1927); Annual No., 86-90 (1926).

Smith, S. The fibrage theory and older theories of the

LINDSAY WIRES

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hollander. Wochbl. Papierfabr. 57, No. 4: 96-97; No. 6: 148-151 (Jan. 23, Feb. 6, 1926); T. S. 83: 44.

Smith, S. Practical beater construction. Wochbl. Papierfabr. 57, No. 38: 1043-1044 (Sept. 18, 1926).

Strachan, J. Hydration of cellulose in paper making. Paper Maker 71, No. 2: 133, 135, 137-141; No. 4: 365-366d (Feb., Apr., 1926); Paper Ind. 8, No. 2: 235-237 (May, 1926); Papierfabr. 24, No. 31: 469-470; (Aug. 1, 1926); C. A. 20: 2068; T. S. 83: 110.

Taylor, W. A. The A. B. C. of hydrogen ion control in paper manufacture. Paper Mill 49, No. 23: 30, 32, 50 (June 5, 1926).

Taylor, W. A. The application of hydrogen ion control to the manufacture of pulp and paper. Paper Trade J. 82, No. 8: 166-167, 169, 171, 173, 177 (Feb. 25, 1926); Paper Mill 49, No. 9: 170, 172, 174, 176, 178, 180, 182, 184 (Feb. 27, 1926); Paper Ind. 7, No. 12: 1983, 1985, 1987, 1989, 1991, 1993 (Mar., 1926); T. S. 83: 50; Tech. Assoc. Papers 9: 38-43 (1926).

Thorsen beater. World's Paper Trade Rev. 85, no. 3:208 (Jan. 15, 1926).

Use of paper machine back waters in the beaters. Papeterie 48:614, 617 (July 10, 1926); T. S. 83:240.

Vorbruggen, —. Beater construction and beating. Wochbl. Papierfabr. 57, no. 14:391 (Apr. 3, 1926); World's Paper Trade Rev. 85, no. 19: 1474 (May 7, 1926).

Bibliography

Graap, E. Bibliography of pulp and paper making. July 1, 1925 to Sept. 30, 1926. Zellstoff u. Papier 6, no. 1:44-47; no. 3:134-137; no. 4:177-179; no. 7:316-321; no. 8:403-406; no. 10: 445-449; no. 11:483-486; no. 12:526-532 (1926).

Papermakers' Association of Great Britain and Ireland, 1922. Bibliography of periodical publications on papermaking and allied subjects during 1924. 37 p. Issued Dec., 1925.

Stream pollution bibliography. Paper Trade J. 82, no. 12:47-48 (Mar. 25, 1926).

West, C. J. Report of the Committee on abstracts and bibliography. Paper Trade J. 82, no. 8:179 (Feb. 25, 1926); Tech. Assoc. Papers 9:44 (1926).

West, C. J. and **Papineau-Couture, A.** Bibliography of paper-making for 1925. Paper Trade J. 82, no. 10:53-55; 11:56-60; no. 12.51-56; no. 13:62-68; no. 14:47-51; no. 15:55-59; no. 16:41-43 (Mar 11 to Apr. 22, 1926); Tech. Assoc. Papers 9:182-214 (1926).

West, C. J. and **Scribner, B. W.** Paper research literature (VII). First supplement. Publications of the Bureau of Standards for 1925. Paper Trade J. 82, no. 20; 49 (May 20, 1926).

Black Liquor

See Sulphite Process

Bleaching

Belani, E. Modern bleaching plants. Papierfabr. 24, no. 49: 762-764 (Dec. 5, 1926).

Belani, E. The Siemens-Billiter method in service of the pulp and paper industry. Papierfabr. 24, no. 10:143-145 (Mar. 7, 1926); T. S. 83: 111.

Bergman, G. K. Relation between the constants for the degree of digestion and bleachability of pulps and the chlorine consumption in technical bleaching. Papierfabr. 24, no. 48:742-746 (Nov. 28, 1926).

Bleaching: preliminary requirements for the same and a study of a large bleaching hollander. Wochbl. Papierfabr. 57, no. 13:354-357 (Mar. 27, 1926); T. S. 83:111; C. A. 20:2748.

Bleaching with liquid chlorine. Paper Making 45, no. 9:356-358 (Sept., 1926).

Boehm, M. E. Cold bleaching at high densities. Paper Mill 49, no. 17:4 (Apr. 24, 1926); Paper Trade J. 82, no. 17:45-46 (Apr. 29, 1926); Paper Ind. 8, no. 2:239-241 (May, 1926); Zellstoff u. Papier 6, no. 9:394 (Sept., 1926); T. S. 83:112; C. A. 20:2071.

Boehm, R. M. Batch bleaching versus the continuous system. Paper Trade J. 83, no. 2:59 (July 8, 1926); Paper Ind. 8, No. 4:635-636 (July, 1926); Paper Mill 49, no. 27:22 (July 3, 1926); World's Paper Trade Rev. 86, no. 5:364-366 (July 30, 1926); T. S. 83:173; C. A. 20:3083.

Funcke, J. The Thorne pulp bleaching process. Papier 29:533-537 (May, 1926); Paper Trade J. 83, no. 3:49-51 (July 15, 1926); Paper Ind. 8, no. 6:1001-1002 (Sept., 1926); Papierfabr. 24, no. 15:217-220 (Apr. 11, 1926); T. S. 83:111, 240; C. A. 20:2748, 3809.

Heijne, O. Bleaching paper fibers with bleaching powder. Svensk Pappers-Tid. 28:510-511, 537-539 (1925); C. A. 20:1519; T. S. 83:112.

Kauffmann, H. Oxidizing and bleaching action of hypochlorite. Chem.-Ztg. 50:101 (1926).

Merrill, A. D. High density bleaching. Paper Trade J. 82, no. 8; 161-162 (Feb. 25, 1926); Paper Mill 49, no. 9:196, 198 (Feb. 27, 1926); Paper Ind. 7, no. 12:2025, 2025, 2027 (Mar., 1926); Tech. Assoc. Papers 9:33-34 (1926); T. S. 83:50; C. A. 20:1520.

Morrison, H. A. Bleach washing on vacuum drum driers. Pulp Paper Mag. Canada 24, no. 9:252-253 (Mar. 4, 1926); Paper Trade J. 82, no. 8:219, 221 (Feb. 25, 1926); Zellstoff u. Papier 6, no. 5:207-207 (May, 1926); Tech. Assoc. Papers 9:63-64 (1926); T. S. 83:68.

Muller, F. Bleaching. Wochbl. Papierfabr., 57, Sondernum: 50-55 (June 12, 1926).

Opfermann, E. Considerations of the Thorne bleaching process. Papierfabr. 24, no. 15:220-22 (Apr. 11, 1926); C. A. 20:2748; T. S. 83;111.

Pomilio, Umberto. Protection and improvement of artificial graphite electrodes in the electrolysis of alkali chlorides. Chimie et Industrie, Special no.:286-316 (Sept., 1925); Pulp Paper Mag. 24:489-491, 515-517, 545-548 (Apr. 29, May 6, 13, 1926); C. A. 20:339.

Roth, F. Chlorate formation in the manufacture of electrolytic chlorine. Zellstoff u. Papier 6, no. 2:71-72 (Feb., 1926); T. S. 83:111.

Rys, L. Control of the manufacture of bleach liquors. Paper Trade J. 83, no. 8:51-52 (Aug. 19, 1926); C. A. 20:3566; T. S. 83:240.

Rys, L. The bleaching of sulphite pulps. Papierfabr. 24, no. 35:529-533 (Aug. 29, 1926); C. A. 20:3809.

Rys, L. The bleaching of sulphite pulp. Effect of chlorates. Papierfabr. 24, no. 41:625-627 (Oct. 10, 1926).

Sansome, R. Bleaching pulp with hypochlorate. Papeterie 48, no. 1:21-25 (Jan. 10, 1926). C. A. 20: 1321; T. S. 83:112.

Schmidt, W. Bleaching of rags. Papierfabr. 24, no. 39: 598-599 (Sept. 26, 1926).

Thorne bleaching system. Papier-Journalen 14, no. 7:84-88 (Apr. 24, 1926); Zellstoff u. Papier 6, no. 6:261-263 (June, 1926.)

Wenzl, H. The bleaching of cellulose. Papierfabr. 24, no. 6:81-88 (Feb. 7, 1926); Paper Trade J. 83, no. 7:50-54 (Aug. 12, 1926); C. A. 20:2478; T. S. 83:111.

Wenzl, H. Developments in the bleaching of pulps. Wochbl. Papierfabr. 57, no. 35:955-960 (Aug. 28, 1926); World's Paper Trade Rev. 86, no. 14:1058 (Oct. 1, 1926); C. A. 20:3809.

Wenzl, H. A rapid tester for the available chlorine in hypochlorite solutions and chlorine bleach baths. Papierfabr, 24, no. 26:406-407 (June 27, 1926); World's Paper Trade Rev. 86, no 3:206 (July 16, 1926); C. A. 20:3809.

Wrede, H. Bleaching apparatus and the bleaching of pulp at high stock concentrations. Papierfabr 24, no. 28:421-427 (July 11, 1926); Wochbl. Papierfabr. 57, no. 33:903-909 (Aug. 14, 1926); Zellstoff u. Papier 6, no. 8:362-363 (Aug., 1926); C. A. 20:3809.

Wrede, H. High density bleaching. Paper Maker, Annual no., p. 57 (1926); T. S. 83:241; C. A. 20:3809.

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Boards

Armantrout, L. L. Boxboard machine speed table. Paper Ind. 7, no. 10:1581-1582 (Jan., 1926).

Bending tester for paperboard. Paper Trade J. 82, no. 3:47 (Jan. 21, 1926).

Boxboard, liner separating from filler. TAPPI Special Reports 1:44-46 (1026).

Boxboard thickness. Pulp Paper Mag. 24, no. 21:611-614 (May 27, 1926); T. S. 83:213.

Bragg, A. O., and Harding, R. H. Paperboard and its manufacture. XI. Paper Trade J. 82, no. 19:51-55 (May 13,1926).

Corrugated paper board, its production and application. Zellstoff u. Papier 6, no. 4:157 (Apr., 1926); T. S. 83:112a.

Deterioration in strength of test board. TAPPI Special Reports 1:111-112 (1926).

Driesens, F. J. J. Developments in strawboard manufacture. Wochbl. Papierfabr. 57, no. 25:681-684; no. 27:736-739 (June 19, July 3, 1926).

Funsett, H. G. Strawboard and strawpaper waste water. Paper Ind. 8, no. 3:461 (June, 1926); Paper Trade J. 82, no. 24: 46-47 (June 17, 1926); C. A. 20:3080.

Hess, W. F. Die Kartonnagenfabrikation; praktisches Handbuch für die gesamte Kartonnagenfabrikation unter besonderer Berücksichtigung neuzeitlicher Arbeitsmethoden. Berlin, M. Krayn, 1926, 475 p. 200 figures.

Hoyer, —. Importance of board testing. Papier und Pappe 3:669-670, 726-727 (1926); Papierfabr. 24:732.

Huth, F. Waterproof and fire-resistant building material from pulp board. Zellstoff u. Papier 6, no. 3:129-130 (Mar., 1926); C. A. 20:2747; T. S. 83:122.

Ingraham, H. G. Modernizing a boxboard mill. Chem. Met. Eng. 32: 782-787 (1925); C. A. 20:3812.

Leather board manufacture. Wochbl. Papierfabr. 57, no. 13:370-375 (Mar. 27, 1926); T. S. 83:118a.

Longitudinal or cylinder machine for strawboard. Wochbl. Papierfabr. 57, no. 38:1041-1043 (Sept 18, 1926).

Naumann, M. Preparation and testing of boards. Papier und Pappe 3:46, 75 (1926); Papierfabr. 24:336.

Paperboard problem. TAPPI Special Reports 1:115-117 (1926).

Problem of board quality. TAPPI Special Reports 1:77-79 (1926).

Pulpboard problem (scorching). TAPPI Special Reports I: 112-115 (1926).

Tensile tester testing board. TAPPI Special Reports 1:81-82 (1926).

U. S. Bureau of Standards. Boxboard thickness. Simplified Practice Recommendations No. 44. Pulp Paper Mag. 24, no. 21: 611-614 (May 27, 1926).

Url, C. Practical hints in paperboard manufacture. Wochbl. Papierfabr. 57, no. 36: 988-990; no. 39:1072-1074 (Sept. 4, 25, 1926).

Cellulose

Arrhenius, S. The physical chemistry of wood cellulose preparation. Medd. Veten. Nobelinst. 6, no. 10 (1925); Paper Trade J. 82, no. 15:65-66 (Apr. 15, 1926); Tech. Assoc. Papers 9:85-86 (1926); T. S. 83:101.

Atsuki, K., and Minaki, T. Action of concentrated sulphuric acid on cellulose and extraction of cellulose from wood. Cellulose Ind. Tokyo 2:3-10 (1926); C. A. 20:3080.

Bain, J. W., and Chute, G. M. The effect of heat upon cellulose. Trans. Royal Soc. Canada III (3), 20:189-191 (1926); Pulp Paper Mag. 24, no. 27: 783 (July 8, 1926; C. A. 20:2411, 2565; T. S. 83:213.

Baker, W. E. B. Report of Committee on Cellulose. Paper Trade J. 82, no. 13:61 (Apr 1, 1926); Tech. Assoc. Papers 9:122 (1926).

Berl, E., and Bitter, J. Viscose. Cellulosechem. 7, no. 10: 137-145 (Oct. 3, 1926).

Berl, E., and Lange, A. Viscose. Cellulosechem. 7, no. 10: 145-147 (Oct. 3, 1926).

Bernardy, G. The determination of the degree of swelling of celulose by the Schwalbe hydrolysis number method. Z. angew. Chem. 39:259-261 (1926); C. A. 20:3806.

Brunswig, H. The question of the molecular size of cellulose. Cellulosechem 7, no. 8:118-121 (Aug. 8, 1926); C. A. 21, 320.

Cellulose, hydrocellulose and oxycellulose. Papeterie 48:10-17 (Jan. 10, 1926).

Dore, W. H., and Sponsler, O. L. The structure of ramie cellulose as derived from X-ray data. In Fouth Colloid Symposium Monograph, Chapter 12. N. Y., Chem. Cat. Co., 1926.

Duclaux, J. The structure of solid colloids. Proc. 2nd Chem. Council Inst. Intern. de Chine Solvay 91-123 (1926); Pulp Paper Mag. 24, no. 51:1547-1553; no. 52:1585-1588 (Dec. 23, 30, 1926); C. A. 20:3606.

Ebner, —. The cellulose riddle. New investigations on the chemistry of fibers. Zellstoff u. Papier 6, no. 9:389-392 (Sept. 1926).

Ehrman, P. General study of the chemistry of cellulose and is principal derivatives. Caoutchouc et gutta-percha 23:13030-13032, 13064-13065, 13099-13102, 13138-13139, 13175-13176, 13240-13241, 13275-13276 (1926); C. A. 20:3805.

Esselen, G. J. Jr. Cellulose: its chemistry with particular reference to the manufacture of rayon. Proc. Am. Assoc. Textile Chem. Colorists 1926:98-100; Am. Dyestuff Rept. 15:166-168 (1926); C. A. 20:1515.

Esselen, G. J., Jr. The future trend of cellulose chemistry. Ind. Eng. Chem. 18:1031-1034 (Oct., 1926); Zellstoff u. Papier 6, no. 12:511 (Dec., 1926).

Faust, O. Swelling of sulphite pulp in sodium and potassium hydroxides at different temperatures. Cellulosechem 7, no. 11:153-155 Nov. 7, 1926).

Faust, O. Swelling of cotton cellulose in sodium and potassium hydroxides of different concentrations. Cellulosechem 7, no. 11; 155-156 (Nov. 7, 1926).

Faust, O., Graumann, E., and Fischer, E. Viscose ripening. Cellulosechem 7, no. 12:165-166 (Dec. 12, 1926.)

Faust, O., and Littmann, K. Artificial silk (Hydratcellulose). Cellulosechem 7, no. 12:166-168 (Dec. 12, 1926).

Gray, H. LeB. Suggested constitutional formula for cellulose. Ind. Eng. Chem. 18:811 (Aug., 1926); C. A. 20:3805; T. S. 83:233.

Griffin, M. L. The copper number as an exponent of the quality of cellulose. Paper Trade J. 82, no. 8:150-151 (Feb. 26, 1926); Paper Mill 49, no. 9:186, 188 (Feb. 27, 1926); Tech. Assoc. Papers 9:22-23 (1926); T. S. 83:8; C. A. 20:1516.

Herzog, R. O. The nature of the structure of cellulose and its significance in chemical transformations. J. Phys. Chem. 30:457-469 (1926); T. S. 83:90; C. A. 20:2068.

Herzog, R. O. Recent developments relating to the colloidal characteristics of cellulose. Pulp Paper Mag. 24, no. 24:699-703 (June 17, 1926); C. A. 20: 3078; T. S. 83:142.

Herzog, R. O. The swelling of cellulose. Kolloid-Z. 39:98-107 (1926); Papierfabr. 24, no. 15:226-228 (Apr. 11, 1926); C. A. 20:3078.

Herzog, R. O. X-rays investigations on cellulose. Pulp Paper Mag. 24, no. 24-694-699 (June 17, 1926); Paper Trade J. 83, no. 1:51-55 (July 1, 1926); discussion, Pulp Paper Mag. 24, no. 27; 784-786 (July 8, 1926); T. S. 83:142; C. A. 20:3077.

Hess, K. Has cellulose a chemical complex of four hexose groups? Naturwissenschaften 14:822-823 (1926); C. A. 21:319. Compare reply by Herzog, ibid., 952.

Heuser, E., and Bartunek, R. Alkali cellulose. III. Cellulosechem 7, no. 12:169 (Dec. 12, 1926).

Heuser, E., and Hiemer, N. Reply to the remarks of K.

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Hess on the depolymerization of cellulose. Z. Elektrochem. 32:47-50 (1926); C. A 20:1321.

Heuser, E., and Schuster, M. Scientific basis of the viscose process. Cellulosechem 7, no. 2-3:17-55 (Mar. 14, 1926); T. S. 83:9.

Hibbert, H., and Parsons, J. L. Oxidation of cellulose. J. Soc. Chem. Ind. 44:473-485 T (1925); Cellulosechem 7. no. 7:97-110 (July 1, 1926); Bull. soc. Ind. Mulhouse 92:572-602 (Oct.-Nov., 1926).

Karrer, P., and Lieser, Th. Polysaccharides. XXXIV. Contribution to the knowledge of hydro- and oxycellulose. Cellulosechem 7, no. 1:1-6 (Feb. 7, 1926); C. A. 20:1515; T. S. 83:90.

Katayama, T. Effect of alkalies on cellulose. Report Osaka Ind. Research Lab. (Japan) 6, no, 1:1-21 (1925); C. A. 20:2745.

Kita, G., and Azami, K. Comparison between bamboo cellulose and cotton cellulose. Cellulose Ind. Tokyo 1:162-164 (1925); C. A. 20:2248.

Kita, G., Mazume, T., Nakashima, T., and Sakrada, I. Esterification of alkali cellulose. Cellulosechem 7, no. 9:135-130 (Sept. 5, 1926).

Kita, G., Mazume, T., Sakrada, I., and Nakashima, T. Esterification of alkali cellulose. II. Influence of salt, soda and alcohol. Cellulosechem. 7, no. 9:130-133 (Sept. 5, 1926).

Lieser, Th. Alkali soluble cellulose. Cellulosechem. 7, no. 6: 85-88 (June 6, 1926); C. A. 21:319.

de Neyman, C. Small-scale laboratory tests on the production of pulverunt cellulose, chlorinated cellulose and cellulose acetate. Chim et Ind. 15:349-352 (1926); C. A. 20-2070; T. S. 83:90.

Ott, E. Investigations of cellulose and lichenin by means of X-ray spectra. Helv. chim. Acta 9:31-32 (1926); C. A. 20:1222.

Ozawa, T. Researches on wood pulp. III. A few properties of purified wood pulp. J. Soc. Chem. Ind. (Japan) 29:78-84 (1926); C. A. 20:3565.

Parsons, J. L. The significance of the alpha-cellulose test for the pulp industry. Paper Trade J. 82, no. 8:211-213 (Feb. 25, 1926); Paper Mill 49, no. 9:126, 128, 130 (Feb. 27, 1926); Paper Ind. 7, no. 12: 2019, 2021, 2023 (Mar., 1926); Tech. Assoc. Papers 9:59-61 (1926); C. A. 20; 1520.

Pictet, Aime. The synthesis of cellulose and the problem of life. Papeterie 48:474-483, 521-526 (May 25, June 10, 1926).

Ritter, G. J., and Fleck, L. C. Chemistry of wood. VIII. Further studies of sapwood and heartwood. Ind. Eng. Chem. 18:576-577 (June, 1926); T. S. 83:141; C. A. 20:2410.

Ritter, G. J., and Fleck, L. C. Chemistry of wood. IX. Springwood and summerwood. Ind. Eng. Chem. 18:608-609 (June, 1926); T. S. 83; 141; C. A. 20:2410.

Schorger, A. W. The chemistry of cellulose and wood. New York, McGraw Hill Book Co., 1926. 596 p. Covers: structure, formation and physical properties of wood, composition of wood, lignin, cellulose, pulp processes and wood pulps, distillation of cellulose and wood, fermentation of cellulose and wood, analytical methods.

Schwalbe, C. G. Standard cellulose. Papierfabr. 24, no. 50: 769-775 (Dec. 12, 1926).

Schwalbe, C. G., and Lange, W. Guignet cellulose from lignocellulose and wood. Z. angew. Chem. 39:606-609 (1926); C. A. 20:3564.

Speakman, H. B. Fermentation products from cellulose. Pulp Paper Mag. 24:731-735 (1926); C. A. 20:3059.

Urban, Helmut. Spruce wood. Cellulosechem. 7, no. 5:73-78 (May 2, 1926); T. S. 83:91; C. A. 20:3080.

Weltzien, W., and Gerhard, —. The action of oxygen on alkali cellulose. Papierfabr. 24, no. 27:413-414 (July 4, 1926); C. A. 20:3806.

Cellulose-Analytical

Birtwell, C., Clibbens, D. A., and Geake, A. Chemical analysis of cotton. XII. Hydrocellulose. J. Textile Inst. 17:145-170T (1926); C. A. 20:1909.

Bubeck, H. Investigations relating to the problems of the alpha-cellulose determination. Papierfabr. 24, no. 23A: 66-71 (June 5, 1926); C. A. 20:3806.

Clibbens, D. A., and Geake, A. The chemical analysis of cotton. XI. The absorption of methylene blue from buffered solutions. J. Textile Inst. 17:127-144T (1926); C. A. 20:1909.

Fargher, R. G., and Higginbotham, L. The chemical analysis of cotton. Loss on scouring. J. Textile Inst. 17:233-246T (1926); C. A. 20; 2752.

Halse, O. M. Determination of cellulose and wood fiber in paper. Papir-Journ 14:121 (1926); C. A. 20:3082.

Waentig, P. Determination of alpha-cellulose. Papierfabr. 24, no. 45: 689-690 (Nov. 7, 1926).

Chips

Nordstrom chip drying tower. Paper Trade J. 83, no. 5:53-54 (July 29, 1926); Zellstoff u. Papier 6, no. 10.435-437 (Oct., 1926); C. A. 20: 3566; T. S. 83:249.

Chlorine Process

Consiglio, G. Use of chlorine gas process in the paper industry; its present applications and future possibilities. Papier 28:1291-1300 (Dec., 1925); C. A. 20: 1518; T. S. 83:43.

Consiglio, G. Chlorine gas process in the paper industry. Papierfabr. 24, no. 50:785-789 (Dec. 12, 1926).

Matignon, C. Preparation of pulp by means of electrolytic chlorine. Génie civil 87:459 (1926); Papierfabr. 24:619.

Matignon, C. The manufacture of cellulose by means of electrolytic chlorine. Génie civil 87:522 (1926); C. A. 20:3806.

Matignon, W. A new outlet for electrolytic chlorine—the manufacture of cellulose. Bull. soc. franc. elec. 5:355-374 (1925), C. A. 20; 1904.

Pritchard, D. A. Economics of the chlorine industry. Paper Trade J. 83, no. 5:49-52 (July 29, 1926).

Wenzl, H. Digestion of plant fibers with chlorine. Papierfabr. 24, no. 52:809-817 (Dec. 26, 1926).

Clays

See Fillers.

Coating Materials—Coated Papers

Allan, J. S., and Beddingfeld, A. L. Gelatine. Paper Maker 71, no. 4:367-369; no. 5:536-537 (Apr., May, 1926); Paper Makers' Mo. J. 64:142-143 (1926); World's Paper Trade Rev. 85, no. 11:812, 814, 816, 818, 874 (Mar. 12, 1926); T. S. 83:173; C. A. 20:3083.

Casein in the paper industry. Pappen und Holzstoff-Ztg. 32:568-572 (1925); Papierfabr. 24:336.

Caulfield, J. G. L., and Bray, P. D. Recovery of paraffin-coated waste papers. Paper Trade J. 82, no. 20:48 (1926); C. A. 20:3083; T. S. 83:163.

Clark, N. Preparation and utilization of hand-brushouts in the coating mill. Paper Trade J. 82, no. 8:205, 207, 209 (Feb. 25, 1926); Paper Mill 49, no. 9:158, 160-161, 166 (Feb. 27, 1926); Paper Ind. 7, no. 12: 1975, 1977, 1979 (Mar., 1926); Tech. Assoc. Papers 9:56-58 (1926); T. S. 83:51.

Clark, N. Relationship between raw stock and coated paper. Paper Ind. 8, no. 9:1531-1535 (Dec., 1926).

Coated papers and offset ink. World's Paper Trade Rev. 86, no. 3: 202, 204 (July 16, 1926).

Griffin, M. L. Coated paper. Paper Mill 40, no. 36: 2, 43-48; no. 37.2, 10-20, 38-40 (Sept. 4, 11, 1926); C. A. 20:3812; T. S. 83:241.

Hamill, G. K. Consideration of glue-bound coated paper. Paper Trade J. 82, no. 8:247, 249, 251 (Feb. 25, 1926); Tech. Assoc. Papers 9:77-79 (1926); T. S. 83:51.

Hamill, G. K., Gottschalk, V. H., and Bicking, G. W. Use of glue in coated paper. U. S. Bureau of Stds. Tech. Papers no. 323, p 635-666; abstr. in Paper Trade J. 83, no. 19:42-44 (Nov. 4, 1926); T. S. 83:241.

Lowe, D. V. Report of coated and processed paper committee. Paper Trade J. 82, no. 8:165 (Feb. 25, 1926); Paper Mill

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49, no. 10:161 (Mar. 6, 1926); Tech. Assoc. Papers 9:37 (1926).

Matagrin, A. Uses of casein in papermaking. Papeterie 47:1097-1102 (1925); 48:121-125, 170-173 (1926); T. S. 83:122; C. A. 20:2071.

Production of montan wax. Zellstoff u. Papier 6, no. 3:130-132 (Mar., 1926); T. S. 83:122.

Stadlinger, H. The purchase of glue. Papierfabr. 24, no. 49: 753-757 (Dec. 5, 1926).

Steadman, B. K. Increasing the suspension of the coating mixture by the addition of colloids. Paper Trade J. 82, no. 8:209 (Feb. 25, 1926); Paper Mill 49, no. 9:166 (Feb. 27, 1926); Pulp Paper Mag. 24. no 11:306 (Mar. 18, 1926; World's Paper Trade Rev. 85, no. 22:1686 (May 28, 1926); Tech. Assoc. Papers 9:58 (1926); T. S. 83:51.

Costs and Cost Accounting

Anderson, H. D. Use of scheduled costs in paper mills. Paper Trade J. 82, no. 3:55-58 (Jan. 21, 1926).

Gould, C. W., Jr. Cost accounting for paper mills. I. Outline of organization and chart of accounts. Paper Ind. 8, no. 5:803-807 (Aug., 1926).

Gould, C. W., Jr. Outline of cost accounting practice in use at L. L. Brown Paper Co. Paper Ind. 7, no. 12:1600-1602 (Jan., 1926).

Halligan, C. W. System of paper mill cost accounting. N. Y., News Print Service Bureau. 86 p. Review in Paper Trade J. 82, no. 10:34, 36, 38.

Kiely, H. U. Technical facts for cost men. Paper Mill 49, no. 40:18, 20, 22, 36 (Oct. 2., 1926); Paper Trade J. 83, no. 15:67 70 (Oct. 7, 1926).

Mirus, —. Cost relations in the paper industry. Wochbl. Papierfabr. 57, no. 17:460-465 (Apr. 24, 1926).

Stevens, F. L. Cost accounting from executives' viewpoint. Paper Trade J. 82, no. 8:293 295 (Feb. 25, 1926); Paper Mill 49, no. 9:29-30, 32 (Feb. 27, 1926).

Stevenson, C. R. Predetermined costs as applied to paper mills. Paper Trade J. 82, no. 11:61-65 (Mar. 18, 1926).

Deinking of Paper

Albrecht, Ed. W. The removal of printers' ink from old papers. Chem.-Ztg. 50:33 (1926); C. A. 20:2071; T. S. 83:92.

Briggs, T. R., and Rhodes, F. H. The deinking of paper. In Fourth Colloid Symposium Monograph, Chapter 22. N. Y., Chem. Cat. Co., 1926.

Bryant, A. Methods of deinking old papers. Paper Mill 49, no. 23:56. (June 5, 1926); Paper Trade J. 82, no. 23:63-64 (June 10, 1926); Pulp Paper Mag. 24, no. 39:1168-1169 (Sept. 30, 1926); T. S. 83:141; C. A. 20:3082.

O'Connor, J. J. Deinking and washing waste paper stock. Paper Trade J. 83, no. 21:37-38 (Nov. 18, 1926); Paper Mill 49, no. 40:10, 12 (Oct. 21, 1926); Paper Ind. 8, no. 7:1201 (Oct., 1926); Pulp Paper Mag. 24, no. 42:1256-1257 (Oct. 21, 1926); T. S. 83:224; C. A. 20:3818.

Stephan, K. The removal of printers' ink from old papers. Z. angew. Chem. 39:269-270 (1926); Chem.-Ztg. 50:137 (1926) C. A. 20:2071; T. S. 83:92.

Wenzl, H. The regeneration of old printing paper. Wochbl. Papierfabr. 57, Sondernum.: 65-70 (June 12, 1926); C. A. 20:3814.

Digesters

Barker, E. R. Panzl digester strainer. Paper Mill 49, no. 20:4 (May 8, 1926); T. S. 83:120a.

Goy, A. Experimental sulphite digester in Norway. Wochbl. Papierfabr. 57, no. 6:152-152 (Feb. 6, 1926); T. S. 83:100.

Hoesch and Co. Report of the disastrous explosion at the Hoesch and Co., plant, Heidenau. Wochbl. Papierfabr, 57, no. 19:527-528 (May 8, 1926).

MacNaughton, W. G. Fresk digester filler. Paper Trade J. 82, no. 5:61 (Feb. 4, 1926); T. S. 83:9; C. A. 20:1322.

Richter, A. F. Digester bricks (sulphite). Paper Mill 49, no. 23:54 (June 5, 1926); T. S. 83:142; C. A. 20:3083.

Skjenneberg, A. C. Svensson's method for filling digesters. Papir-Journalen 14, no. 9:112-114 (May 29, 1926); Zellstoff u. Papier 6, no. 9:399-400 (Sept., 1926); C. A. 20:3080.

Superheated steam for pulp cooking. TAPPI Special Reports 1:67-73 (1926).

Zeipel, F. von. Calculations relating to the strength of plane container walls with special reference to steam receptacles in so-called digesters of both ingot and cast iron. Svensk Pappers-Tid. 28:189-191, 222-224, 280-283, 314-315, 338-340 (1926); C. A. 20:3813.

Directories

Annual directory of the Italian paper and printing trade. Reviewed in Pulp Paper Mag. 24:1037.

Canadian Pulp and Paper Association. The pulp and paper mills of Canada. 1926. 50 p. Reviewed in Pulp Paper Mag. 24:1436.

Directory of paper makers of the United Kingdom. London, Marchant Singer and Co.

Finish timber and paper calender, 1926. 342 p. Reviewed in Papierfabr. 24:418.

Hladufka, A. Südosteuropäisches Papieradressbuch. Vienna, Zentralblatt für die Papierind., 1926. Reviewed in Papierfabr. 24:492.

Lockwood directory of the paper and allied trades. 52nd ed., 1927. N. Y., Lockwood Trade Journal Co., 1926. Reviewed in Papier-Ztg. 51:3024.

Paper maker's directory of all nations. London, Dean and Son. 1000 p. Reviewed in Chem. News 133:125; Pulp Paper Mag. 24:1035.

Paper mills' directory of England, Scotland and Ireland. 66th ed. London, Simpkin, Marshall, Hamilton Kent and Co. Reviewed in World's Paper Trade Rev. 85:410.

Paper trade diary directory of Great Brtiain, India and the colonies. 1926. London, Trade Journals, Ltd.

Phillips' Paper trade directory of the world. 1926-27 edition. Reviewed in World's Paper Trade Rev. 86:1424.

Pulp and paper makers directory of Sweden, Norway, Denmark and Finland, 1925-1926. 8th ed.

Paper and pulp mill catalogue, 1926 edition. 475 p. Chicago, Ill., Edward B. Fritz.

Svensk Industri-Kalender, 1926. Stockholm, 1926. Reviewed in Papierfabr. 24:461.

Note: These data are fragmentary because the books were not available for examination.

Drying

Arnot, J. M. Drying problem; some practical considerations. Paper Makers' Mo. J. 64:97-100 (Mar. 15, 1926); World's Paper Trade Rev. 85, no. 10:732, 734, 736, 738; no. 11:826, 828 (Mar. 5, 12, (1926); Paper Maker 71, no. 3:241, 243-244(Mar. 1926); T. S. 83:112a.

Baker, W. N. Report of paper drying committee. Paper Trade J. 82, no. 8:151 (Feb. 25, 1926); Tech. Assoc. Papers 9:23 (1926).

Belani, E. New dewatering device for pulps. Wochbl. Papierfabr. 57, no. 3:70-74 (Jan. 16, 1926); T. S. 83:75.

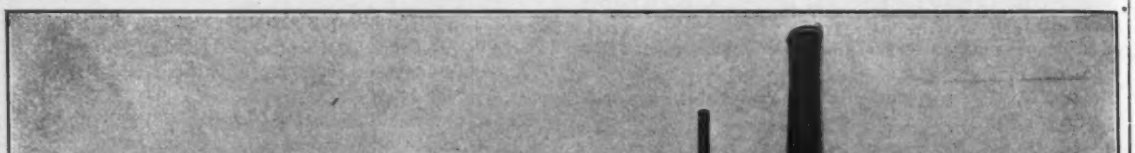
Boyer, M. W., and Buss, J. Measurement of surface temperatures. I. Portable thermocouple device compensated for heat loss. Ind. Eng. Chem. 18, no. 7:728 (July, 1926); Paper Trade J. 83, no. 14:50-51 (Sept. 30, 1926); T. S. 83:242.

Brandt, O. Ventilators and exhaustors in the paper industry. Zellstoff u. Papier 6, no. 3:124-125 (Mar., 1926); T. S. 83:121a.

Dwyer, P. Drier shells for paper mills. Foundry 54-930-935 (1926).

Fletcher, S. W. Paper mill ventilation. Paper Ind. 8, no. 2: 271, 273, 275 (May, 1926); T. S. 83:212.

Golbs, Georg H. The drying action of the paper machine.



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Papierfabr. 24, no. 48:737-741; no. 49:757-762; no. 51:798-802; no. 52:817-827 (Nov. 28, Dec. 5, 19, 26, 1926).

Harvey, A. R. Automatic control of moisture content. Paper Trade J. 82, no. 8:227-229 (Feb. 25, 1926); Paper Ind. 7, no. 12:2009, 2011 (Mar., 1926); Tech. Assoc. Papers 9:67-68 (1926); T. S. 83:53.

Kimball, H. S. Paper drying. The Barrus system: a simple and efficient method of draining driers. Paper Trade J. 82, no. 6:49 (Feb. 11, 1926); T. S. 83:53.

Klemm, P. Paper structure and drying. Wochbl. Papierfabr. 57, Sondernummer:92-98 (June 12, 1926).

Latimer, H. Papermaking problems. World's Paper Trade Rev. 85, no. 4:266, 268, 270 (Jan. 22, 1926).

McBain, B. T. The Fidalgo pulp drying system. Paper Mill 49, no. 40:6 (Oct. 2, 1926).

MacNaughton, W. G. The paper drying operation. Paper Trade J. 82, no. 2:41-42 (Jan. 14, 1926); Tech. Assoc. Papers 9:142-144 (1926); T. S. 83:53.

Minton, O. Thermodynamic comparison of paper drying methods. Paper Trade J. 82, no. 8:152-157 (Feb. 25, 1926); Paper Mill 49, no. 9: 146-148, 150, 152, 154, 156, 168 (Feb. 27, 1926) Tech. Assoc. Papers 9:24-29 (1926); T. S. 83:53.

Oeman, E. Evaporation relations at the drying end.. Papierfabr., 24, Festheft: 42-48 (June 5, 1926).

Paper drying and the effect on sizing quality. TAPPI Special Reports 1:50-54 (1926).

Paper drying process. Paper Trade J. 83, no. 21:43-44 (Nov. 18, 1926).

Paper mill ventilation. Paper Mill 49, no. 13:4, 6 (Mar. 27, 1926).

Penberthy venturi drier circulator. Pulp Paper Mag. 24, no. 35:1032-1035 (Sept. 2, 1926); Paper Trade J. 83, no. 14:45 (Sept. 30, 1926); T. S. 83:242.

Removal of condensate from the driers. Paper Trade J. 83, no. 9: 55 (Aug. 26, 1926).

Ruby, A. Charts for use in the rapid calculation of steam consumption in drying. Papier 28: 1321-1332 (Dec. 1925) T. S. 83:112a.

Skagerberg, R. Relation of drying, ventilating and operating costs. Paper Mill 49, no. 45:6, 8 (Nov. 6, 1926).

Steam in driers. Supercalender 16, no. 5:721-722 (Dec., 1925); cf. 15, no. 9: 681-683 (Apr., 1926); 16, no. 4:717-718 (Nov., 1925).

Durability

Deterioration of paper. Paper Maker, Intern. no., 1925, p. 55, 58.

Hall, G. Permanence of paper. Paper Trade J. 82, no. 14; 52-58 (Apr. 8, 1926); Zellstoff u Papier 61, no. 6:263-4 (June, 1926); Tech. Assoc. Papers 9:92-98 (1926); T. S. 83:121.

Kohler, S., and Hall, G. Investigations into the durability of paper. Statens Provningsanstalt, Stockholm, Meddelande 28. 1925 84 p. Text in Swedish, summary in English.

Matagrin, Am. Protection of paper against its enemies. Papeterie 46:646-650; 47:563-566, 614-618, 710-714, 750-754, 997-1001, 1138-1145 (1925); 48:25-29 (1926); C. A. 20:2071; T. S. 83: 163.

New York Times to use rag paper. Paper Mill 49, no. 51:10, 16 (Dec. 18, 1926).

Permanence of rope fibers. Paper Trade J. 83, no. 5:52 (July 29, 1926.

Walker, Waldo. Times to print copies on durable rag paper. Paper Trade J. 83, no. 24:30, 32 (Dec. 9, 1926).

Dyes and Dyeing

Beltzer, A. Coloring of paper. Paper Maker, Intern. No. (July 29, 1926).

Beyer, A. Improving the fastness of dyes to light when applied to paper. Papier 29:307-319 (Mar., 1926); Paper Trade J. 82, no. 21:53-60 (May 27, 1926); C. A. 20:3083; T. S. 83:163.

Dyestuffs for coloring paper. Paper Maker, Intern. no., 1925, p. 61-63.

Ekholm, I. Paper coloring. Some points of view regarding the dyeing of paper fibers with coal tar dyes in the beater. Paper Trade J. 82, no. 19:56 (May 13, 1926); T. S. 83:163; C. A. 20:3083; Dyestuffs 27, no. 8:125 (Aug., 1926).

Gottlober, M. Paper dyeing (Ostwald color scale). Papierfabr. 24, no. 42:641-644; no. 43:660-662; no. 44:674-678 (Oct. 17-31, 1926).

Haempel, O. The action of dyes used in paper making on the animal life of streams. Z. Nahr. Genussm. 50:423-526 (1925); C. A. 20:1291.

Jenkins, S. H. Theories of dyeing.. Pulp Paper Mag. 24, no. 22:646-647 (June 3, 1926); T. S. 83:163.

Lottermoser, A. Physical chemistry of the dyeing theories. Textilberichte 7:146, 225 (1926).

Mann, Leonard. The coloring of paper. Making Paper 8, no. 7:238-244 (Jan., 1926).

Merz, Aug. Application of dyes to paper making. Paper Mill 49, no. 41:10, 14-16, 42 (Oct. 9, 1926).

Noll, Aug. Dyestuff testing. Papierfabr. 24, no. 39:593-595 (Sept. 26, 1926).

Pigment colors versus coal tar dyes. Dyestuffs 27, no. 1: 14-15 (Jan., 1926); Paper Mill 49, no. 8:40 (Feb. 20, 1926); Paper Maker, Annual No. 91 (1926); World's Paper Trade Rev. 86, no. 3:198 (July 16, 1926); Pulp Paper Mag. 24, no. 12:344 (Mar. 25, 1926); T. S. 83:51; Paper Making 45, no. 4:157-158 (Apr., 1926).

Refsaas, I. Dyeing of paper. Papir-Journ. 14, no. 22:278-282 (Dec. 16, 1926).

Roberts, J. R. Colored back water and two-sidedness. Paper Making 45, no. 1:34-35 (Jan., 1926).

Silbermann, H. Hilfapparate fur den Färber und Koloristen. An Hand der deutschen Patentliteratur 1913-1925. Leipzig, Jänecke, 1926. 173 p. 151 illustrations. Reviewed in Papierfabr. 24:475.

Tinting paper by dipping and calender staining. Paper Ind. 7, no. 10:1580 (Jan., 1926); T. S. 83:51.

Unkle method of coloring paper. Paper Mill 49, no. 51:4 (Dec. 18, 1926).

Weisz, H. The influence of illumination on standard colors. Wochbl. Papierfabr. 57, no. 30:835-839 (July 24, 1926); Paper Maker, Annual no., 25, 27-28 (1926); T. S. 83: 163, 241; Papier 29:539-543 (May, 1926).

Weltzien, W. Influence of fiber structure of mechanical and dyeing properties. Cellulosechemie 7:84 (1926).

Electricity in Paper

Schahle, —. Electrification of paper. Papierfabr. 24, no. 42: 648-650 (Oct. 17, 1926).

Speter, M. Frictional electricity in paper. Papierfabr. 24, no. 8:119-120 (Feb. 21, 1926); T. S. 83:163.

Electricity in papermaking

Bergeon, P. Electric steam boilers and their use in the paper industry. Papier 28:1283-1289 (Dec., 1925); T. S. 83:67.

Hargreaves, W. Steam and electric driving in paper mills. World's Paper Trade Rev. 85, no. 9:652, 654, 656, 658; no. 10:770, 772, 774 (Feb. 26, Mar. 5, 1926); T. S. 83:213.

Kessler, O. The first German machine for fine paper with multiple motor drive. Wochbl. Papierfabr. 57, Sondernummer; 57-64 (June 12, 1926).

Lee, C. F. Drives for supercalenders and platers. Paper Mill 49, no. 43:10, 46 (Oct. 23, 1926); Pulp Paper Mag. 24, no. 45:1349-1351 (Nov. 11, 1926).

Liljeblad, R. Electrical sectional drives for paper machines. Svensk Pappers-Tid. 28, no. 19:507-508; no. 20:538-540; no. 21: 573-576 (Oct. 15-Nov. 15, 1926).

Norris, R. N. Sectional electric drive for paper machines.

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J. Am. Inst. Elec. Engrs. 45:432-437 (May, 1926); Paper Ind. 8, no. 1:85-89 (Apr., 1926); T. S. 83:121, 164.

Rogers, H. W. Development of the sectional paper machine drive. J. Am. Inst. Elec. Engrs. 45, no. 4:323-329 (1926); Paper Ind. 8, no. 1:78-82 (Apr., 1926); T. S. 83:121, 144.

Rogers, H. W. Types of paper machine drives and the essential requirements. Pulp Paper Mag. 24, no. 44:1320-1322 (Nov. 4, 1926); Paper Trade J. 83, no. 17:43-44 (Oct. 21, 1926).

Rogers, R. H. Trend in paper mill electrification. Paper Mill 49, no. 41:1, 6 (Oct. 9, 1926); Paper Trade J. 83, no. 17:41-42 (Oct. 21, 1926); Pulp Paper Mill 24, no. 40:1189-1190 (Oct. 7, 1926).

Staege, S. A. Electrification of paper making machines. J. Am. Inst. Elec. Engrs. 45:272-281 (1926); Paper Ind. 8, no. 1:72-77 (Apr., 1926); T. S. 83:121a.

Winklemann, H. Advantages and disadvantages of individual and multiple electric motor drives. Papierfabr. 24, no. 15:201-203 (Apr. 14, 1926); T. S. 83:134.

Employees

Crossley, T. L. Why no training system. Paper Mill 49, no. 21:4, 8 (May 22, 1926).

Novius, J. H. Formean training in paper industry. Paper Ind. 7, no. 10:1583-1588; no. 11:1751-1753; no. 12:1934-1937; 8, no. 1:65-67; no. 2:246-248 (Jan.-Apr., 1926).

Spawn, J. N. Vocational education in industry. Paper Mill 49, no. 26:20, 22, 24, 26, 36, 38, 40 (June 26, 1926).

Williamson, H. Lessons in paper making. I. Introduction. Paper Ind. 8, no. 3:427-431 (June, 1926). II Dryer felts. *Ibid.*, No. 4:621-623 (July, 1926). III. Wrinkles and rips. *Ibid.*, No. 5:798-801 (Aug., 1926). IV. Presses. *Ibid.*, no. 6:969-971 (Sept., 1926). V. Presses (crowns and couching). *Ibid.*, no. 7:1166-1169 (Oct. 1926). VI. Wet felts and their handling. *Ibid.*, no. 8:1349-1352 (Nov., 1926). VII. Suspensions of fibers—slice velocity, *Ibid.*, no. 9:1527-1531 (Dec., 1926).

Esparto

Cittanova, J. Esparto. Papeterie 48:77 (1926).

Clark, J. d'A. Esparto pulp by the Keebra process. World's Paper Trade Rev. 85, no. 19:1522, 1524 (May 7, 1926); Pulp Paper Mag. 24, no. 28:815 (July 15, 1926); Paper Maker, Annual no., 1926, p 23; C. A. 20:3083.

Evaporators

Black liquor evaporation problems. TAPPI Special Reports 1:73-77 (1926).

Corrosion of evaporators for black liquors. TAPPI Special Reports I 105-111 (1926).

Evaporator test code for pulp mills. Paper Mill 48, no. 9:88 (Feb. 27, 1926); Paper Trade J. 81, no. 8:203 (Feb. 25, 1926); Tech. Assoc. Papers 9:55 (1926); T. S. 83:42.

Webre, A. L., and **Robinson, Clarke S.** Evaporation. New York, Chem. Cat. Co., 1926. 500 p.

de Wolf, P. Evaporation in paper making. Paper Mill 49, no. 48:14,16 (Nov. 27, 1926).

Explosion Process

Exploding wood into fiber. Paper Mill 49, no. 52:20, 22 (Dec. 25, 1926).

Low temperature explosion process for the production of wood pulp. Paper Trade J. 83, no. 8:53-54 (Aug. 19, 1926).

Mason process for defibering wood. Paper Trade J. 83, no. 3:47-48 (July 15, 1926).

Felts

Belani, E. Drier felts. Papierfabr. 24, no. 13:199-200 (Mar. 28, 1926); T. S. 83:121a.

Felt life and the effect of suction boxes. TAPPI Special Reports I:46-48 (1926).

Howell, K. B. Observations on operating economy of the roofing felt industry. Paper Trade J. 83, no. 2:57-58 (July 8, 1926).

Nuttall, J. The paper machine; the clothing of the wet end. World's Paper Trade Rev. 85, no. 4:260-264 (Jan. 22, 1926); Paper Maker 71, no. 2:141, 143, 145 (Feb., 1926).

Postl, H. Drying felts. Papierfabr. 24, no. 38:582-584 (Sept. 19,. 1926).

Rees, E. A. Analysis of press felt performance in a modern news mill. Pulp Paper Mag., Intern. no., 103-110 (Feb., 1926); T. S. 83:164.

Relative width of felts and press rolls. TAPPI Special Reports I:3-7 (1926).

Smith, R. W. New device for increasing paper machine output while improving quality (Felt conditioner). Paper Mill 49, no. 18: 10, 38 (May 1, 1926); T. S. 83:121a.

Williamson, H. Drier felts. Paper Ind. 8, no. 4:621-623 (July, 1926.

Williamson, H. Wet felts and their handling. Paper Ind. 8, no. 8:1349-1352 (Nov., 1926).

Fillers

Bonnet, G., and **Cuzin, J.** Some effects of fillers on production costs. Papier 28, no. 12:1315-1319 (Dec., 1925); T. S. 83:121

Grigorjew, P. Determination of the reactions of clays and kaolins. Bum Prom., 1926, no. 9; Wochbl. Papierfabr. 57:1252.

Lorenz, R. Methods for the determination of the size of filler particles. Papierfabr. 23, no. 48:753-759, 24, no. 3:33-36; no. 5:74-76; no. 6:91-92 (1926-1926); T. S. 83:51, 122.

Norwegian talc and soapstone. Zellstoff u. Papier 6, no. 12:517-520 (Dec., 1926).

Postl, H. Asbestine. Papierfabr. 24, no. 26:398-402 (June 27, 1926.

Postl, H. Paper fillers in the Harz mountains. Papierfabr. 24, no. 13:191-193 (Mar. 28, 1926); T. S. 83:122.

Roschier, H. The filling and sizing of paper. Papierfabr. 24, no. 23:348-50; no. 24:363-365; no. 25:384-388 (June 6-20, 1926); C. A. 20:3813.

Shaw, M. B., and **Bicking, G. W.** Paper fillers. Bureau of Standards Tech. Paper no. 301, p. 733-748 (1925); Paper Trade J. 82, no. 3:46 (Jan. 21, 1926); Pulp Paper Mag. 24, no. 6:153-159 (Feb. 11, 1926); Wochbl. Papierfabr. 57, no. 39: 1080-1082 (Sept. 25, 1926); C. A. 20:1321; T. S. 83:50.

Suitability of fillers for the paper industry. Wochbl. Papierfabr. 57, no. 43;1184-1186 (Oct. 23, 1926).

Talc in paper making. Paper Maker, Annual no., 1926, p. 73-74; T. S. 83:241.

Trimm, W. B. Experimental tests on the use of bentonite in the manufacture of waterproofing compound for paperboard. Canada, Dept. Mine, Mines Br., 1926, no. 643, p. 20-21; C. A. 20:2411.

Wittmann, E. Determination of the absorption capacity of several Russian kaolins. Bum. Prom. 1926, no. 9; Wochbl. Papierfabr. 57:1253.

Filters

Geisler, K. W. Continuous filter. Zellstoff u. Papier 6, no. 1:26-31 (Jan., 1926); T. S. 83:84.

Hoyt, J. T. Elimination of white water waste with the American continuous filter. Paper Ind. 7, no. 11:1765-1768 (Feb., 1926); Paper Trade J. 82, no. 6:50-54 (Feb. 11, 1926); T. S. 83:120a.

Liebeherr, E. Filters for waste water. Zellstoff u. Papier 6, no. 4:159-160 (Apr., 1926).

Postl, H. Filter for waste water. Papierfabr. 24, no. 45:691 (Nov. 7, 1926).

General

Baker, H. P. Report of association work. Paper Mill 49, no. 9:12, 14, 18, 20, 22 (Feb. 27, 1926).

Bauer, K. An account of a trip to America. Wochbl. Papierfabr. 57, no. 5:122-124 (Jan. 30, 1926); T. S. 83:84.

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Beveridge, K. The papermakers' pocket book. Third and enlarged edition. 412 p. New York, Van Nostrand, 1925.

Brecht, W. Recent developments in pulp and paper manufacture in America. Wochbl. Papierfabr. 57, no. 5:122-124; no. 10:273-275; no. 15:413-416; no. 21:584-588; Sondernummer, 37-50; no. 26:707-709; no. 30:827-829; no. 33:909-911; no. 35:961-963 (Jan. 30, Mar. 6, Apr. 10, June 26, July 24, Aug. 14, 28, 1926); T. S. 83:84, 110; C. A. 20:1518.

Clapperton, G. M. Practical paper-making; a manual for papermakers and owners and managers of paper mills. Third edition, revised and partly rewritten by R. H. Clapperton. London, Lockwood and Son, 1926. 220 p. Reviewed in World's Paper Trade Rev. 85:332; Paper Making 45:75-76; Pulp Paper Mag. 24:1425.

Clark, J. d'A. Pulp and paper manufacture in North America. World's Paper Trade Rev. 86, no. 12:864, 866, 868, 922, 924; no. 13: 954, 956, 958, 998, 1000; no. 14:1024, 1026, 1028, 1030, 1032; no. 15: 1110, 1112, 1114, 1116, 1118; no. 16:1192, 1194, 1196, 1238, 1240; no. 17:1274, 1276, 1278, 1316, 1318, 1320; no. 18:1354, 1356, 1358, 1396, 1398, 1400; no. 19:1476, 1478, 1480, 1484; no. 20:1556, 1558, 1562; no. 21:1636, 1638, 1640, 1642; no. 22:1718, 1720, 1722, 1724; no. 23:1796, 1798, 1800, 1802; no. 24:1884, 1886, 1888, 1890; no. 25: 1964, 1966; no. 26: 2046, 2048, 2050, 2052; no. 27:2098, 2100, 2102, 2106 (Sept. 17 to Dec. 31, 1926). In part in Pulp Paper Mag. 24, no. 41:1223-1225; no. 42:1253-1255; no. 49:1479-1481; no. 50:1509-1511; no. 51:1555-1558; no. 52:1589-1592 (Oct. 14, 21, Dec. 9, 23, 30, 1926); Paper Trade J. 83, no. 25:45-49; no. 27:39-40 (Dec. 16, 30, 1926).

Duxbury, N. Canadian and American paper mills. World's Paper Trade Rev. 85, no. 16:1220, 1222, 1224, 1226; no. 17:1362, 1364 (Apr. 16, 23, 1926); Paper Maker 71, no. 5:505, 507, 509, 511, 513 (May, 1926); T. S. 83:134.

Fall meeting of the Technical Association of the Pulp and Paper Industry. Tech. Assoc. Papers 9, no. 2 (Oct., 1926).

Hawley, L. F., and Wise, L. E. The chemistry of wood. New York, Chemical Catalog Co., 1926. 334 p. Covers chemical components of wood, proximate and summative analyses of wood, decomposition of wood and wood as an industrial material.

Hoyer, F. Die Cellulosefabrikation. Technischer Teil, zugleiche Ergänzungsband zu Schubert: Cellulosefabrikation. 4th ed. Berlin, Krayn, 1926.

MacNaughton, W. G. Manufacture of pulp and paper in 1925. Paper Trade J. 81, no. 18:35-41 (Oct. 29, 1925); Making Paper 8, no. 9:310-319; no. 10:350-353 (Mar., Apr., 1926).

MacNaughton, W. G. Survey of progress in the industry. Paper Trade J. 83, no. 18:59-62, 64, 66, 68, 70 (Oct. 28, 1926).

Mallinson, A. B. Impressions of American paper mills. World's Paper Trade Rev. 85, no. 14:1068, 1070, 1072, 1074, 1076, 1078 (Apr. 2, 1926); Paper Mill 49, no. 16:22, 24, 26, 30 (Apr. 17, 1926); T. S. 83:134.

History

Alibaux, H. The French paper industry in the 16th, 17th, and 18th centuries. Papier 29:349-359 (Apr., 1926); Paper Trade J. 83, no. 6:59-60 (Aug. 5, 1926).

Ambrosiani, S. The older history of paper manufacturing. Svensk Pappers-Tid. 28, no. 3:63-64; no. 10:246-248 (Feb. 15, May 31, 1926).

Bacqué, F. Progress of the paper industry in the 18th century. Papier 29:683-690 (July, 1926).

Baker, H. P. Paper history of New England. Paper Mill 49, no. 42:20, 22, 24, 26, 28 (Oct. 16, 1926).

British paper makers in Egypt. World's Paper Trade Rev. 85, no. 3:200 (Jan. 15, 1926).

Everest, D. C. The growth of paper making. Paper Trade J. 82, no. 1:38, 40, 42, 44 (Jan. 7, 1926).

Groud, Ch. The origin of the paper machine. Papier 29, no. 4:425-427 (Apr., 1926); Paper Trade J. 83, no. 2:55-56 (July 8, 1926); T. S. 83:121a; Paper Making 45, no. 9:360-361 (Sept., 1926).

History of writing paper. Paper maker, Intern. no., 1925, p. 101-102.

Holmes, E. The first patents for paper making. Pulp Paper Mag. Canada 24, no. 37:1102 (Sept. 16, 1926).

Hössle, F. von. Bavarian paper history. Papierfabr. 24, no. 8:117-119; no. 9:126-128; no. 11:155-157; no. 13:189-191; no. 14: 209-212; no. 15: 222-226; no. 16:238-242; no. 21:313-317; no. 23a: 49-64 (Feb. 21, 28, Mar. 14, 28, Apr. 4-18, May 23, June 5, 1926).

Hössle, F. von. Old paper mills of the Rhine province. Wochbl. Papierfabr. 57, no. 17:473-478; no. 21:581-584; Sondernummer: 11-27; no. 28:773-776; no. 30:849-853; no. 42:1149-1151; no. 45:1238-1240 (Apr. 24, May 22, June 12, July 10, 31, Oct. 16, Nov. 6, 1926).

Hössle, F. von. The old paper maker Wehrfritz. Zellstoff u. Papier 6, no. 10:450-453 (Oct., 1926).

Johnsson, P. Tycho Brache as a paper maker. Svensk Pappers-Tid. 28, no. 7:162-164 (Apr. 15, 1926); Zellstoff u. Papier 6, no. 9:401 (Sept., 1926).

King, D. Paper making, a historical survey. Paper Making 45, no. 9:362-363 (Sept., 1926).

Knowlton, G. W. Early manufacture of newsprint from wood pulp. Paper Ind. 8, no. 6:967-968 (Sept., 1926).

Knowlton, G. W. History of the Voelter grinder. Paper Mill 49, no. 37:4, 6 (Sept. 11, 1926); T. S. 83:224.

Lichnerowicz, Jeanne. The old paper mills of Auvergne. Papyrus t:255-259 (Apr., 1926).

Lund, J. The inventor of sulphite pulp. Paper Making 45:313-314 (Aug., 1926); C. A. 20:3807; T. S. 83:224.

MacNaughton, W. G. Wood pulp paper, 1800 A. D. Paper Trade J. 82, no. 2:44-45 (Jan. 14, 1926).

Martell, P. History of the paper industry in Westphalia. Papierfabr. 24, no. 40:609-613 (Oct. 3, 1926).

Neuberger, F. History of Swiss paper manufacture. Zellstoff u. Papier 6, no. 11:487-489 (Nov., 1926).

Pulp grinders fifty years ago. Pulp Paper Mag. 24, no. 2:29-30 (Jan. 14, 1926).

Rue, J. D. Fifty years' progress in the pulp industry. Ind. Eng. Chem. 18:917-919 (1926).

Schwann, M. Development of the Rheinish paper industry. Papierfabr. 24, no. 2:24-26 (Jan. 10, 1926).

Sudgen, A. V., and Edmondson, J. L. History of English wall paper. London, Batsford, 1926. Reviewed in World's Paper Trade Rev. 85:1694.

Hollander

Haussner, A. Work of disintegration in the newer hollanders. Zellstoff u. Papier 6, no. 8:352-355 (Aug., 1926).

Hollander and paper machine. Wochbl. Papierfabr. 57, no. 40:1104-1106; no. 45:1240-1242 (Oct. 2, Nov. 6, 1926).

Hollander operation. Paper Maker, Annual no., 1926, p. 83-85.

Peteer, —. Efficiency of the hollander. Wochbl. Papierfabr. 57, no. 42:1155-1159 (Oct. 16, 1926).

Peteer,—. Hollander construction. Zellstoff u. Papier 6, no. 1:32 (Jan., 1926).

Smith, S. The fibrage theory and older theories of the hollander. Wochbl. Papierfabr. 57, no. 4:96-97; no. 6:148-151 (Jan. 23, Feb. 6, 1926); T. S. 83:44.

Vorbruggen,—. Beater (hollander) construction and beating. Wochbl. Papierfabr. 57, no. 14:391 (Apr. 3, 1926); World's Paper Trade Rev. 85, no. 19:1474 (May 7, 1926).

Keebra Process.

Clark, J. d'A. The Keebra process. Paper Maker 72, no. 5:474, 476 (Nov., 1926); Paper Trade J. 83, no. 22:43-45 (Nov. 25, 1926); Zellstoff u. Papier 6, no. 12:512-513 (Dec., 1926).

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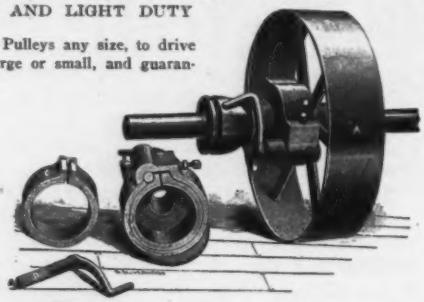

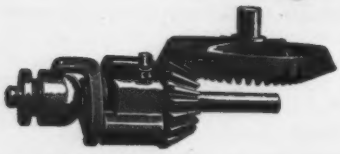

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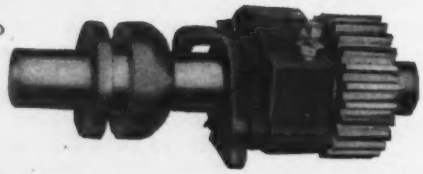

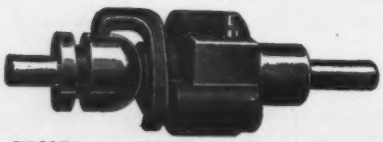

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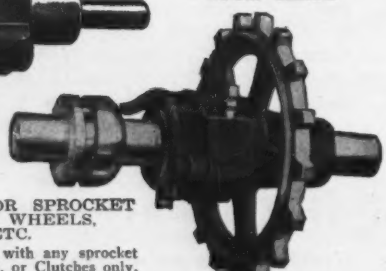

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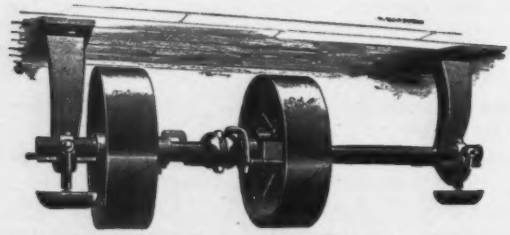

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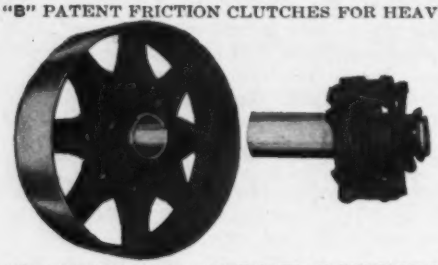

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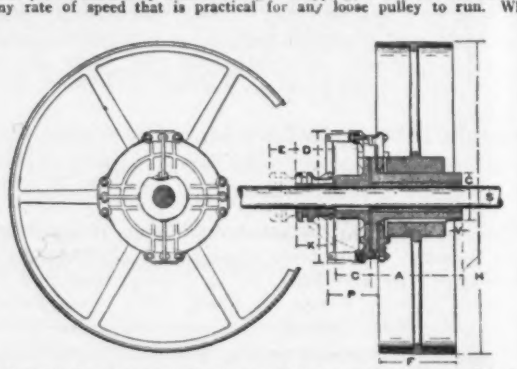
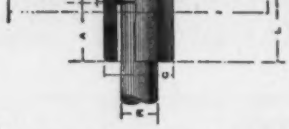


out of clutch they are perfectly free and when in clutch are as rigid as if keyed to the shaft. Can be thrown in and out of clutch without slacking speed of motive power. Will start heavy loads gradually, while running fast, without injury to the clutch or machinery. All clutches are provided with friction pads which prevent cutting or wearing of the metal surfaces and make the friction practically indestructible. These Friction Clutches are also furnished for sprocket wheels, rope wheels, and all kinds of gearing.



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Kraft Paper

Aitkens, W. S. Manufacture of kraft paper. World's Paper Trade Rev. 86, no. 26:2004 (Dec. 24, 1926).

Heijne, O. Kraft pulp and kraft paper. Svensk Pappers-Tid. 28, no. 2:32-35 (Jan. 31, 1926); T. S. 83:102.

Heijne, O. Salt water in the manufacture of kraft paper. Super-Calender 16, no. 1:703-4; no. 4:715-716 (Aug., Nov., 1926).

Klein, A. St. Notes on kraft pulp and paper manufacture. Zellstoff u. Papier 6, no. 3:114-118 (Mar., 1926); Paper Ind. 8, no. 2:262-264 (May, 1926); T. S. 83:102.

See also Sulphate process.

Lighting

Hutton, M. Modern principles of good lighting. Pulp Paper Mag. 24, no. 18:509-511 (May 6, 1926); T. S. 83:134.

Lignin

Freudenberg, K., and Hess, H. Method for recognizing different hydroxyl groups and its application to lignin. Ann. Chem. 448:121-133 (1926).

Friedrich, A., and **Diwald, J.** Lignin. I. Lignin from pine wood. Monatsh. 46:31-46 (1925); T. S. 83:91.

Friedrich, A., and **Brude, B.** Lignin. II. Preparation of primary lignin. Monatsh. 46:597-610 (1926).

Fuchs, W. Die Chemie des Lignins. Berlin, Springer, 1926. 327 p.

Genberg, G. P., and **Jonsson, T.** Roe's chlorine number and relation to per cent lignin determined by a modified Halse method. Paper Trade J. 82, no. 22:50-52 (1926); C. A. 20:3083; T. S. 83:163.

Kellin, C. Present status of lignin research. Svensk Kem. Tids. 37:209-219 (1925); T. S. 83:91. 190 references.

Klason, P. The constitution of spruce lignin. Pulp Paper Mag. 24, no. 33:965-967 (Aug. 19, 1926); C. A. 20:1516, 3566.

Klason, P. Contribution to the knowledge of lignin from spruce wood. Svensk Pappers-Tid. 28:609-610 (1925); C. A. 20:1516.

Klason, P. Constitution of spruce wood lignin. III. Tech. Assoc. Papers 9:98-100 (1926).

Klein,—. Occurrence and transformation of lignin in the plant world. Zellstoff u. Papier 6, no. 9:392-393 (Sept., 1926).

Lieseh, Th. Lignin. Cellulosechemie 7, no. 11:156-160 (Nov. 7, 1926).

Marcusson, J. Lignin and oxycellulose theory. Z. angew. Chem. 39:898-900 (1926); C. A. 20:3348.

Mehta, M. M. Biochemical and histological studies of lignification. I. The nature of lignin; its physiological significance and its estimation in timbers. Biochem. J. 19:958-978 (1925); T. S. 83:91.

Mueller, W. J., and **Hermann, W.** The determination of lignin in wood and wood pulps. Papierfabr. 24, no. 13:185 (Mar. 28, 1926); C. A. 20:2746; T. S. 83:120.

Paloheimo, L. Use of acid hydrolysis in the determination of lignin. Biochem. Z. 165:463-464 (1925); C. A. 20:2583; T. S. 83:141.

Rusnev, P. The chemistry of lignin. Centralb. gesam. Forstw. 49:281-294 (1923); C. A. 20:3459; T. S. 83:213.

Scott, A. A. Note on the formula for lignin. Pulp Paper Mag. 24, no. 30:884 (July 29, 1926).

Theory of lignin formation. Papierfabr. 24, no. 46:713-714 (Nov. 14, 1926).

Urban, H. Spruce wood. Cellulosechem. 7, no. 5:73-78 (May 2, 1926); T. S. 83:91; C. A. 20:3080.

Wenzl, H. Isolation of lignin with a mixture of phosphoric acid and hydrochloric acid. Cellulosechem. 7, no. 6:88-89 (June 6, 1926); C. A. 21:321.

Zhereboff, L. P. Composition of lignin. Bum. Prom. 3, no. 9:495-506; no. 12:686-709 (1924); Tech. Assoc. Papers 9:101-112 (1926).

Lubrication

Barnard, D. P., Jr. Oil flow in plain bearings. Ind. Eng. Chem. 18:460-462 (May, 1926); T. S. 83:204.

Becker, A. E. Surface action and fluid film lubrication. Some film thickness measurements. Ind. Eng. Chem. 18:471-477 (May, 1926); T. S. 83:212; C. A. 20:2409.

Brewer, A. F. Lubrication of paper mill machinery. Paper Trade J. 82, no. 9:55-57 (Mar. 4, 1926); T. S. 83:67.

Dayan, J. Lubrication in the paper industry. Papier 29:947-948 (Sept., 1926).

Dial, T. E. Conversion costs as effected by lubrication. Paper Ind. 8, no. 3:471, 473, 475 (June, 1926); Paper Mill 49, no. 24:8, 20 (June 14, 1926); T. S. 83:204.

Dover, M. V. Comparison of lubricating efficiencies of oils and some of their physical and chemical properties. Ind. Eng. Chem. 18:499-501 (May, 1926); T. S. 83:212; C. A. 20:2409.

Gill, A. H., and **Gill, Helen.** Possible test for oiliness of oils. Ind. Eng. Chem. 18:527 (May, 1926); T. S. 83:204.

Gilson, E. G. Some little understood factors affecting lubrication. Ind. Eng. Chem. 18:467-470 (May, 1926); T. S. 83:212; C. A. 20:2409.

Howarth, H. A. S. Characteristics of full and partial journal bearings. Ind. Eng. Chem. 18:453-460 (May, 1926); T. S. 83:212; C. A. 20:2409.

Koethen, F. L. The role of graphite in lubrication. Ind. Eng. Chem. 18:497-499 (May, 1926); C. A. 20:2409; T. S. 83:212.

Fearsons, L. W., and **Taylor, G. R.** Lubricating value as related to certain physical and chemical properties of oils. Ind. Eng. Chem. 18:493-496 (May, 1926); C. A. 20:2409; T. S. 83:212.

Vacuum Oil Co. Progress in paper mill lubrication. Paper Trade J. 82, no. 25:59-60 (June 24, 1926); T. S. 83:204.

Wilharm, W. C. The role of oiliness in industrial lubrication. Ind. Eng. Chem. 18:463-467 (May, 1926); C. A. 20:2409; T. S. 83:212.

Machinery

Belani, E. The "Malhator" and the "Erkensator," two new devices for the manufacture of paper board and paper. Wochbl. Papierfabr. 57, no. 19:535-540 (May 8, 1926).

Christian, O. Practical devices for the mechanical transference of the paper web to the couch roll. Wochbl. Papierfabr. 57:792-796 (July 17, 1926).

Crowning calender. Super-Calender 16, no. 5:720 (Dec., 1926).

Doing away with the deckle strap. Paper Ind. 7, no. 12:1927-1929 (Mar., 1926); World's Paper Trade Rev. 85, no. 18:1398 (Apr. 30, 1926).

Felting of fibers on the paper machine. Papierfabr. 24, no. 40:613-614 (Oct. 3, 1926).

Gottlöber, M. The possibility of decreasing the loss in the manufacture of paper. Papierfabr. 24, no. 24:366-373 (June 13, 1926).

Hoyer, F. Is a simplification and with it an improvement of the construction of paper machines possible? Papierfabr. 24, no. 39:595-597 (Sept. 26, 1926).

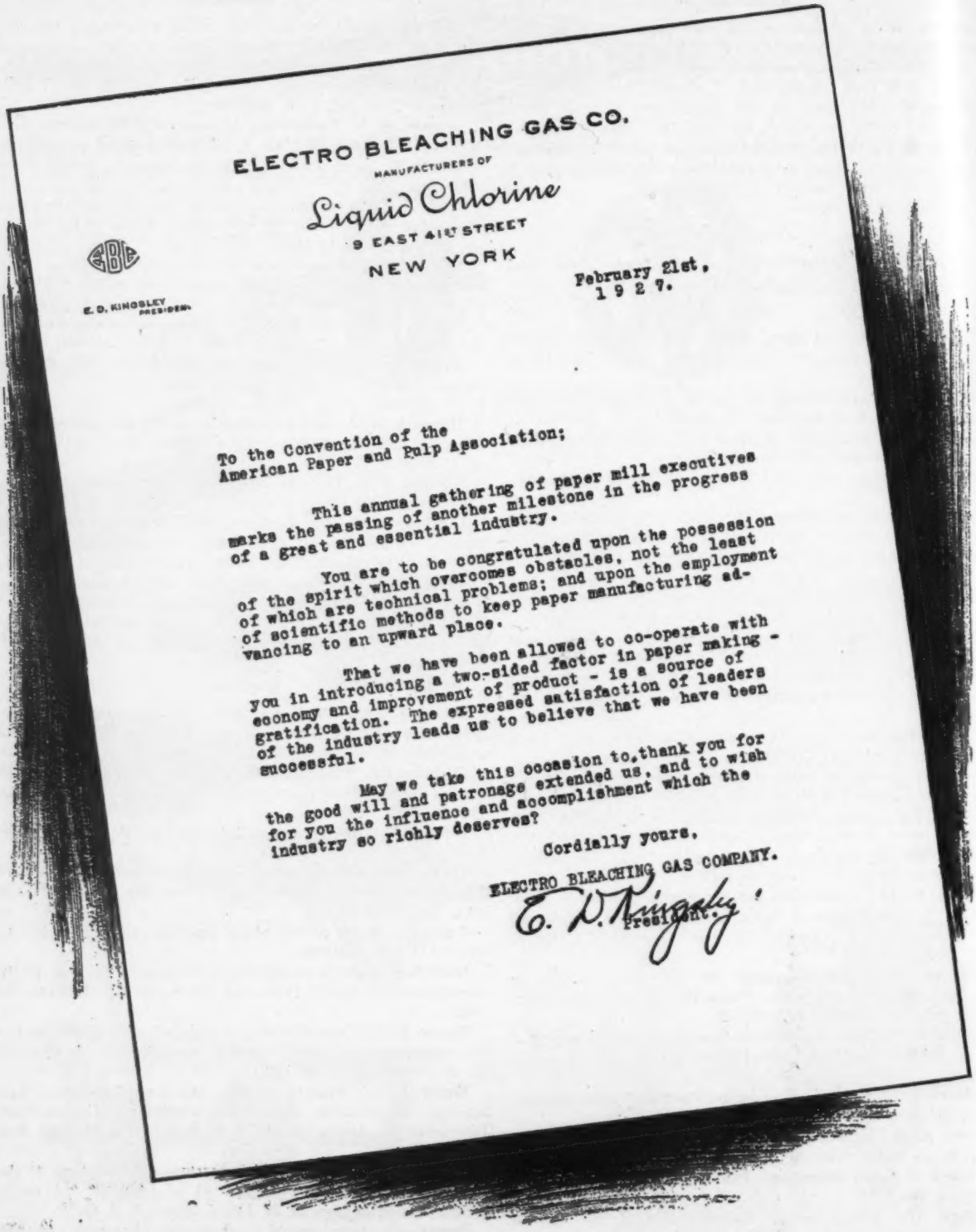
Muller, F. Die Papierfabrikation und deren Maschinen. Verlag des "Wochenblatt fuer Papierfabrikation," Güntter-Staib, Biberach-Riss. 440 p. Reviewed in World's Paper Trade Rev. 86:1942.

Nuttall, J. The paper making machine—the clothing at the wet end. World's Paper Trade Rev. 85, no. 4:260, 262, 264; no. 5:380-381; no. 6:423 (Jan. 22, 29, Feb. 5, 1926); T. S. 83:75.

Papyro,—. Paper machine operation. Papeterie 46:1094, 1097; 47:54-58, 161-165, 265-269, 362, 365, 462-466, 654-658, 705-706, 806, 809, 849-853, 942-946, 1086-1090; 48:66-73 (1924-1926); T. S. 83:121a.

Peteer,—. Longitudinal wire or cylinder machine for straw board. Wochbl. Papierfabr. 57, no. 20:562-563 (May 15, 1926).

Schmid, W. Consideration of fiber deposition on the wire of



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President.

the paper machine. Papierfabr. 24, no. 19:282-284 (May 9, 1926).

Switzer, P. D. An improved doctor for calenders and dryers. Paper Mill 49, no. 19:12, 16 (May 1, 1926).

Sylvestre, V. Use of the Brown-Boveri quick-acting regulator on paper machines driven by back-pressure turbines. Papier 29: 191-192 (Feb., 1926).

Table roll bearings. Paper Trade J. 83, no. 25.54 (Dec. 16, 1926).

Wentz, S. C. Passing of the deckle strap. Paper Mill 49, no. 23:26, 28 (June 5, 1926); Pulp Paper Mag. 24, no. 24:705, 712b (June 17, 1926); Making Paper 8, no. 12:435-436 (June, 1926); T. S. 83:164.

Machines-Power Requirement

Golbs, G. H. Power requirements of paper machines. Wochbl. Papierfabr. 57, no. 3:60-63; no. 7:180-183; no. 12:322-325; no. 14:386-390; no. 18:502-503; no. 20:558-562; no. 23:640-642; no. 28:777-780; no. 31:854-857; no. 34:932-935; no. 37:1012-1016; no. 39:1067-1071; no. 41:1126-1131; no. 44:1212-1217; no. 49:1353-1361 (1926); T. S. 83:67, 121.

Rappold, H. Theory of the drive and power requirements of paper machines. Papierfabr. 24, no. 28:428-431; no. 29:437-439; no. 32:489-491; no. 33:499-503; no. 34:516-520; no. 37:566-569; no. 38:577-582 (July 11, 18, Aug. 8, 15, 22, Sept. 12, 19, 1926).

Staege, S. A. Power requirements of paper machines. Paper Trade J. 82, no. 8:215, 217, 219 (Feb. 25, 1926); Pulp Paper Mag. 24, no. 12:341-343 (Mar. 25, 1926); Paper Ind. 7, no. 12:1979, 1981, 1983 (Mar., 1926); Tech. Assoc. Papers 9:61-63 (1926); T. S. 83:68.

Mechanical Pulp

General

Argy, M. J. The manufacture of ground wood. Pulp Paper Mag. 24, no. 15:419-421 (Apr. 15, 1926).

Bearce, G. D. Production control in the newsprint industry. Mech. Eng. 48:48-52 (1926); C. A. 20:3814.

Brawn, W. E. Report of the Mechanical pulp committee. Paper Trade J. 82, no. 8:157 (Feb. 25, 1926); Paper Mill 49, no. 9: 114 (Feb. 27, 1926); Tech. Assoc. Papers 9:29 (1926).

Burgman, A. Osk. Several methods and experiments in the Kangas (Finland) mechanical pulp mill. Papir-Journalen 14, no. 11:134-135 (June 30, 1926).

How to pile groundwood. TAPPI Special Reports. I:32-35 (1926).

Kolotilov, I., Chramzov, I., and **Kardakov, A.** American methods for the manufacture of news print. Papierfabr. 24, no. 44:678-680 (Oct. 3, 1926).

Liebeherr, E. Practice of groundwood manufacture. Wochbl. Papierfabr. 57, no. 19:525-527 (May 8, 1926).

Lindt, V. Metallographic studies on corrosion in the pulp and paper industry and wood grinders. Papierfabr. 24, no. 34: 513-515; no. 35:534-539 (Aug. 22, 29, 1926); C. A. 20:3680.

Mallison, A. B. Wood mills in Canada. Paper Maker 71, no. 4:366D-367 (Apr., 1926).

Mowatt, J. H. Mechanical pulp and its physical property of wetness. Paper Maker 71, no. 1:59-61 (Jan., 1926); World's Paper Trade Rev. 84:1988-1996 (1925); C. A. 20:1322; T. S. 83:44.

Teicher, J. Holzschleiferi. A part of Carl Hofmann's Praktisches Handbuch der Papierfabrikation. 3rd ed. Berlin, Hofmann, 1926. 122 p. Reviewed in Papierfabr. 24:434; World's Paper Trade Rev. 85:1230; Paper Trade J. 83, no. 19:55.

Grinders

Brawn, W. E. Proposed code for comparison of grinders as developed by the Mechanical pulp committee of TAPPI, 1925. Paper Trade J. 82, no. 8:191, 193, 195 (Feb. 25, 1926); Paper Mill 49, no. 9:104, 106, 108 (Feb. 27, 1926); Pulp Paper Mag. 24, no. 9: 249-251 (Mar. 4, 1926); Tech. Assoc. Papers 9:45-51 (1926); T. S. 83:43.

Hoyer, F. Pulp stones Papierfabr. 24, no. 47:728-731 (Nov. 21, 1926).

Kerr wood grinder Pulp Paper Mag. 24, no. 5:133 Feb. 4, 1926); T. S. 83:43.

Klimpe,—. Considerations of the grinder process. Wochbl. Papierfabr. 57, Sondernummer: 77-79 (June 12, 1926).

Liebeherr, E. Wood grinding. Zellstoff u. Papier 6, no. 5:199-200 (May, 1926); T. S. 83:110.

McBain, B. T. Pulp stones—correct speed power and pressure. Paper Mill 49, no. 44:4 (Oct. 30, 1926).

Nenzel, G. Continuous grinder. Wochbl. Papierfabr. 57, no. 9:237-243 (Feb. 27, 1926); T. S. 83:110.

Palmgren, E. Recent improvements in wood grinders—Zellstoff u. Papier 6, no. 10:433-435 (Oct., 1926).

Rogers, H. H. Pulp grinder load regulation. Paper Trade J. 82, no. 18:58-59 (May 6, 1926); T. S. 83:110.

Ruhlemann, F. Critical considerations of wood grinders. Wochbl. Papierfabr. 57, no. 22:617-620 (May 29, 1926).

Sackel, W. The continuous grinder. Theoretical considerations. Papierfabr. 24, no. 6:88-91 (Feb. 7, 1926); T. S. 83:110.

Skjenneberg, A. C. Modern grinding methods—drive controls. Papir-Journ. 14, no. 4:48-51; no. 5:61-60 (Mar. 9, 20, 1926).

Sokolowskii, D. Formula for grinder performance. Zellstoff u. Papier 6, no. 3:118-120 (Mar., 1926); T. S. 83:110.

Wintermeyer,—. The continuous grinder. Wochbl. Papierfabr. 57, no. 2:39-42; no. 3:64 (Jan. 9, 16, 1926); Papierfabr. 24, no. 5:65-73 (Jan. 31, 1926); Paper Ind. 8, no. 5:818 (Aug., 1926).

Meters

Meter slush paper stock. Paper Trade J. 83, no. 9.56 (Aug. 26, 1926).

Mills

Bearce, G. D. Roof construction in paper mills. Paper Trade J. 83, no. 27:37-38 (Dec. 30, 1926); Paper Mill 49, no. 52:16, 37 (Dec. 25, 1926); Pulp Paper Mag. 24, no. 52:1593-1594 (Dec. 30, 1926).

Deterioration of walls in a sulphate mill. TAPPI Special Reports I:103-105 (1926).

Developments at Powell River. Pulp Paper Mag. 24, no. 43:1288-1292 (Oct. 28, 1926).

John Galloway and Co., Ltd. Paper Makers 71, no. 4:370-382 (Apr., 1926).

Mallalieu, W. E. Fire losses in pulp and paper mills. Paper Ind. 8, no. 9:1544-1555 (Dec., 1926).

Mallinson, A. B. Wood mills in Canada. Paper Maker 71, no. 4:366D-367 (Apr., 1926).

Modern daylight paper mill. Paper Mill 49, no. 46:22, 24 (Nov. 13, 1926).

Port Alfred Pulp and Paper Corporation. Pulp Paper Mag. 24, no. 32:933-936 (Aug. 12, 1926).

Venkajee, T. The Bengal Paper Mills, Ltd., Rajahmundry, India. Paper Trade J. 82, no. 19:57-58 (May 13, 1926).

Weston, H. E. Factors determining the location of pulp and paper mills. I. Sketch of industry's growth and a study of water supply. Paper Ind. 8, no. 5:787-792 (Aug., 1926). II. Raw materials and transportation facilities. *Ibid.* No. 6:979-983 (Sept., 1926). III. Markets, power and labor supply. *Ibid.* No. 7:1163-1165 (Oct., 1926). IV. Disposal of waste and investment. *Ibid.* No. 8:1356-1359 (Nov., 1926).

News Print

Another definition of standard newsprint. Paper Mill 49, no. 47:1 (Nov. 20, 1926); Pulp Paper Mag. 24, no. 46:1377-1379 (Nov. 18, 1926).

Moerbeek, B. H. Newsprint manufacture. Svensk Pappers-Tid. 28, no. 6:132-135 (Mar. 31, 1926); Wochbl. Papierfabr. 57: 466-469 (Apr. 24, 1926); T. S. 83:102.

See also Mechanical pulp.

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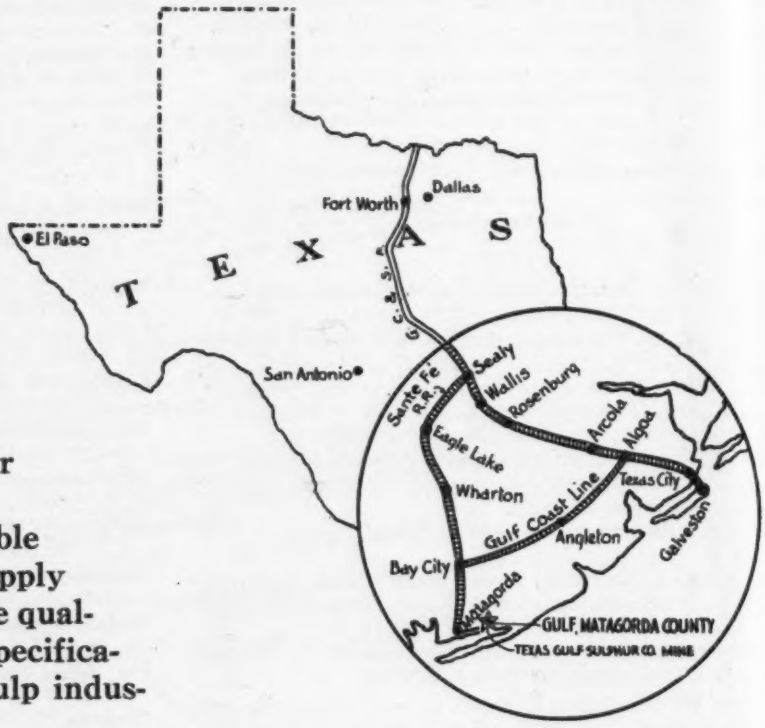

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different parts of the paper machine. Bum. Prom. 1926, no. 9; Wochbl. Papierfabr. 57:1252.

Curling of paper. TAPPI Special Reports I:89-91 (1926).

Dennett, Phillips. Uniform quality paper. World's Paper Trade Rev. 85, no. 22:1666 (May 28, 1926).

Fay, H. The waviness of paper. Zellstoff u. Papier 6, no. 12:509-510 (Dec., 1926); cf. *ibid.* no. 10:431; no. 11:467-469 (Oct., Nov., 1926.)

Paper and the sulphur dioxide content of pulp. TAPPI Special Report I:79-81 (1926).

Postl, H. The moistening of paper. Wochbl. Papierfabr. 57, no. 32:893-895 (Aug. 7, 1926).

Wavy edges in paper. Wochbl. Papierfabr. 57, no. 49:1361-1362 (Dec. 4, 1926).

Paper Testing

Aitken, J. E. Value of photomicrography. World's Paper Trade Rev. 86, no. 25:1968 (Dec. 17, 1926).

Atmospheric conditions for paper testing. Paper Trade J. 82, no. 18:55-58 (May 6, 1926).

Belani, E. The modern high power microscope and the photographic ocular "phoku" of Prof. Siedentopf. Wochbl. Papierfabr. 57, no. 21; 595-599; no. 23:647-651; no. 26:717-722 (May 22, June 5, 26, 1926).

Booth, H. C. Apparatus for measuring the mechanical conditions of paper. J. Sci. Instruments 4:5-8 (Oct., 1926); World's Paper Trade Rev. 86, no. 24:1842, 1844, 1846 (Dec. 10, 1926).

Brecht, W. The Eastman colorimeter. Papierfabr. 24, Festheft: 72-86 (1926); C. A. 20:3813.

Breitwein, K., and Sowetowa, A. Determination of fibers by a colorimeter method. Bum. Prom. 1926, no. 6; Papierfabr. 24:790; Wochbl. Papierfabr. 57:1112.

Bright, C. G. The Bright stain. Pulp Paper Mag. 24, no. 22:645-646 (June 3, 1926); T. S. 83:163; C. A. 20:3081.

Carson, F. T. Small constant humidity testing cabinet. Paper Trade J. 82, no. 8:231-237 (Feb. 25, 1926); Paper Mill 49, no. 11:4, 6,48; no. 12:46 (Mar. 13, 20, 1926); Tech. Assoc. Papers 9:67-72 (1926); T. S. 83:52; C. A. 20: 1340.

Cornely, R. The testing of blotting paper. Zellstoff u. Papier 6, no. 3:120-122 (Mar., 1926); T. S. 83:121; C. A. 20: 2747.

Differentiation of sulphite and soda pulps in paper. Mitt. Materialprüfungsamt Berlin-Dahlem, n. f., no. 2:38-39 (1926).

Fay, H. Water absorption by different fibers under different conditions of atmospheric moisture. Zellstoff u. Papier 6, no. 5: 201-203 (May, 1926); T. S. 83:121.

Fenchel, K. The bursting strength tester. Papierfabr. 24, no. 20:294-295 (May 16,1926); C. A. 20:3813.

Halse, O. M. Determination of cellulose and mechanical pulp in paper. Papir-Journ. 14, no. 10:121-123 (June 12,1926); T. S. 83: 213.

Herzberg, W. Water resistance of paper. Papier-Ztg. 51, no. 103; 3022 (Dec. 25, 1926.)

Herzberg, W. Normal paper control, 1913-1925. Papierfabr. 24, no. 33:505 (Aug. 15, 1926; Wochbl. Papierfabr. 57, no. 32:887-888 (Aug. 7, 1926); Zellstoff u. Papier 6, No. 8:356 (Aug., 1926).

Instrument for measuring the effect of wetting on the dimensions of paper. Mon. Papeterie Belge 6:715 (Nov., 1926).

Jones, A. Annular-oblique illumination for the microscopy of surface texture. Paper Trade J. 83, no. 16:56-65 (Oct. 14, 1926.)

Kohler, G., and Hall, G. Investigations into the strength of writing paper. Pulp Paper Mag. 24, no. 15:423-424 (Apr. 15, 1926).

Manipulation of apparatus for testing water expansion. Papierfabr. 24, no. 23a: 98-103 (June 5, 1926).

Meaning of paper tests. TAPPI Special Reports I:23-28 (1926.)

Naumann-Schopper bending tester. Papier 29:985-986 (Sept., 1926).

New blotting tester. World's Paper Trade Rev. 86, no. 9:638 (Aug. 7, 1926).

New method for testing paper (microscope). Papier-Ztg. 51, no. 64:1836, 1838 (Aug. 11, 1926); Wochbl. Papierfabr. 57, no. 49:1368-1370 (Dec. 4, 1926).

Opacity tests. World's Paper Trade Rev. 85, no. 23:17-92 (June 4, 1926).

Peckham, H., and Brecht, W. Study of the Eastman universal colorimeter for determining the color of paper. Paper Trade J. 82, no. 17:47-54 (Apr. 29, 1826); Tech. Assoc. Papers, 9:11-18 (1926); C. A. 20:2070; T. S. 83:121.

Reed, E. O. Atmospherice conditions for paper testing. Minority report of TAPPI Paper testing committee. Paper Trade J., 82, no. 18: 55-57 (May 6, 1926); C. A. 20:2071; T. S. 83:121.

Reimann, R. Papierprugungen. Handbuch der Praxis über Papierprüfungsmethoden und Papierbegutachtungen. Leipzig, Verlag der "Neuen Deutschen Papier Zeitung," 1926. Review in Papierfabr. 24:377.

Report of the Chief of Tests. In Annual Report of the Public Printer, 1926, p. 73-97.

Ruhlemann,—. Methods of testing individual cellulose fibers and similar fine substances for their mechanical properties. Zellstoff u. Papier 6, no. 1:24-26 (Jan., 1926.)

Sammet, F. C. New tearing tester. Paper Trade J. 83, no. 26:40 (Dec. 23, 1926).

Schulz, H., and Ewald, W. Measuring the luster of paper. Zellstoff u. Papier 6, no. 10:247-429 (Oct., 1926).

Scriber, B. W. Report of the paper testing committee. Paper Trade J. 82, no. 8:253, 255 (Feb. 25, 1926); Paper Mill 49, no. 9:98, 100 (Feb. 27, 1926); Tech. Assoc. Papers 9:144-145 (1926).

Scribner, B. W. Atmospheric conditions for paper testing. Majority report of TAPPI paper testing committee. Paper Trade J. 82, no. 18: 57-58 (May 6, 1926); C. A. 20:2071; T. S. 83:121.

Stiffness of paper. Zellstoff u. Papier 6, no. 2:77-78 (Feb., 1926); T. S. 83:112a.

Stfachan, J. The new piezo-micrometer. World's Paper Trade Rev. 86, no. 5:324; no. 25:1922, 1924 (July 30, Dec. 17, 1926).

Stretch and shrinkage in paper. A new Schopper apparatus. World's Paper Trade Rev. 86, no. 16:1244 (Oct. 15, 1926).

Technical Association of the Pulp and Paper Industry. Official paper testing methods. Sampling. Fiber composition. Conditioning paper for testing. Bursting strength. Tensile breaking strength. Active sulphur. Coating of mineral coated paper. Resin in paper. Paper Trade J. 83, no. 11:51-55 (Sept. 9, 1926); Pulp Paper Mag. 24, no. 20:572-575 (May 20, 1926); Wochbl. Papierfabr. 57, no. 48:1332-1335; no. 50:1390-1391 (Nov. 27, Dec. 11, 1926); Paper Ind. 8, no. 2:264-266; no. 5:810-812 (May, Aug., 1926); Zellstoff u. Papier 6, no. 12:515-516 (Dec., 1926).

Testing currency paper. Paper Mill 49, no. 22:20 (1926); World's Paper Trade Rev. 86, no. 5:368 (July 30, 1926); C. A. 20:3081; T. S. 83:204.

Testing penetrability of paper to water. Zellstoff u. Papier 6, no. 4:164 (Apr. 1926).

Testing of yellowed paper. Wochbl. Papierfabr. 57, no. 47: 1299-1301 (Nov. 20, 1926).

Tschudi, H. The Elmendorf tearing apparatus. Wochbl. Papierfabr. 57, no. 35:964-965 (Aug. 28, 1926).

Water resistance of paper. Zellstoff u. Papier 6, no. 4:164 (Apr., 1926); T. S. 83:121.

Wisbar, G. Phloroglucinol reaction of paper after alkaline treatment. Wochbl. Papierfabr. 57, no. 41:1131-1132 (Oct. 9, 1926).

Power

Beaumont, W. W., and Burt, L. N. Modern developments of paper mill plant. Proc. Inst. Mech. Eng. (London), 1926 I:421-522; Engineering 71:539-542, 570-573 (1926); Paper Maker 71, no. 5:485, 487 (May, 1926); World's Paper Trade Rev. 85, no. 18:1418, 1420, 1422, 1423 (Apr. 30, 1926); Pulp Paper

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Mag. 24, no. 19:541-544 (May 13, 1926); T. S. 83:134; C. A. 20:2072, 3348.

Belani, E. Gas machine as a source of power for the pulp and paper industry. Papierfabr. 24, no. 2:17-21 (Jan. 10, 1926); T. S. 83:67.

Belani, E. High pressure turbine "Bauart Brunn" in the pulp and paper industry. Papierfabr. 34, no. 23:350-355 (June 6, 1926).

Bradshaw, G. D. Concentration in boilers. Paper Trade J. 82, no. 1:53-57 (Jan. 7, 1926); T. S. 83:67.

Brandt, O. Utilization of waste gases in the pulp and paper industry. Zellstoff u. Papier 6, no. 4:162-164 (Apr., 1926).

Caillol, R. Protection of steam boilers against scale and corrosion. Chaleur et Industrie 6:357-362, 419-424, 464-474 Aug.-Oct., 1925); Papier 28:1087-1092, 1203-1206; 29:161-165, 273-280; 393-397, 493-502 (Oct., 1925-May, 1926); C. A. 20:467.

Campbell boiler feed regulator. Paper Trade J. 83, no. 13: 48-49 (Sept. 23, 1926).

Combustion steam generator. Paper Trade J. 82, no. 2:45; no. 12:49-50 (Jan. 14, Mar. 25, 1926); T. S. 83:67, 134.

Darling, A. G. Power and process steam from higher pressures. Paper Trade J. 82, no. 8:163-165 (Feb. 25, 1926); Paper Mill 49, no. 9:132, 134, 136 (Feb. 27, 1926); Tech. Assoc. Papers 9:35-37 (1926); T. S. 83:67.

Desmarroux, —. The Arca regulator. Papier 29:69-70 (Jan., 1926); T. S. 83:67.

Emmons, F. A. Selection of worm gear speed reducers of proper capacity. Pulp Paper Mag. Canada 24, no. 22:633-635 (June 3, 1926).

Engine, turbine or motor for the paper machine. TAPPI Special Reports 1:38-43 (1926).

Erard, P. Modern control methods of boiler room operations. Papier 29:851-865 (Aug., 1926).

Farnsworth, F. C. Heat losses in paper mills. Paper Mill 49, no. 39:20, 22 (Sept. 25, 1926).

Frost, S. E. Paper mill applications of the Pulmax drive. Paper Mill 49, no. 19:14, 46 (May 1, 1926); T. S. 83:134.

Glatfelter, P. H. Identification of piping systems. Paper Trade J. 82, no. 8:183; 185, 187, 189 (Feb. 25, 1926); Paper Mill 49, no. 15:20, 22, 24, 26 (Apr. 10, 1926) Tech. Assoc. Papers 9:45-48 (1926); T. S. 83:67.

Gleason, E. P. Power problems in the paper industry. Paper Ind. 8, no. 9:1521-1527 (Dec., 1926).

Härlin, A. Power and heat consumption in the paper industry. Svensk Pappers-Tid. 28, no. 1:9-13 (Jan. 15, 1926); C. A. 20:1517; T. S. 83:102.

Hargreaves, W. Boiler house efficiency. World's Paper Trade Rev. 84, no. 26: 1966-1972; 85, no. 1:42, 44, 46 (Dec. 18, 1925; Jan. 1, 1926); T. S. 83:67.

Hobday, L. Power plants in small paper mills. World's Paper Trade Rev. 85, no. 7:492, 494, 496, 498, 554, 556; discussion, no. 8:610, 612, 614 (Feb. 12, 19, 1926); Paper Maker 71, no. 3:273-275, 277, 279-280 (Mar., 1926).

Hoyer, F. Steam turbine in the paper mill. Svensk Pappers-Tid. 28, no. II:284-286 (June 15, 1926).

Huc, E. Heat losses and the tightness of the valves. Papier 29:49-56 (Jan., 1926); T. S. 83:67.

Lassberg, F. v. Die Wärmewirschaft in der Zellstoff- und Papier-Industrie. 2nd ed. Berlin, Springer, 1926. Reviewed in Papierfabr. 24.434.

Leeper, R. W. Report of heat, light and power committee. Paper Trade J. 82, no. 8:229, 231 (Feb. 25, 1926); Tech. Assoc. Papers 9:68-69 (1926).

Marchand, M. Steam regulation and the Ruths accumulator. Papier 29:59-68 (Jan., 1926); T. S. 83:67.

Meitzer, K. Use of heat and power in the paper industry. Papierfabr. 24, no. 17:257-258 (Apr. 25, 1926).

Michel, —. Problems in power management. Wochbl. Papierfabr. 57, no. 28:766-767 (July 10, 1926).

Muller, R. O. The Terry turbine for paper machine drive. Paper Mill 49, no. 43:22, 23, 24, 26, 42 (Oct. 23, 1926).

Nielsen Co., A. C. Performance of firebond in maintenance of boiler furnace walls. Paper Mill 49, no. 52:4 (Dec. 25, 1926).

Power and fuel requirements of a Swedish factory. Zellstoff u. Papier 6, no. 2:74 (Feb., 1926).

Pragst, E. New developments in steam turbines. Pulp Paper Mag. 24, no. 44:1317-1320 (Nov. 4, 1926).

Pulverized fuel for paper mills. World's Paper Trade Rev. 85, no. 5:370, 372, 374 (Jan. 29, 1926).

Romanet, E. Evolution of steam boilers in the paper industry. Papier 29:759-767 (July, 1926).

Ruhl, C. Use of heat and power in paper manufacture. Papierfabr. 24, no. 7:97-106 (Feb. 14, 1926); T. S. 83:134.

Sheehan, A. F. Effecting economies in boiler room. Paper Ind. 8, no. 3:423-425 (June, 1926).

Speed reduction methods. Paper Trade J. 83, no. 12:55 (Sept. 16, 1926).

Various types of speed reducers for industrial machinery. Pulp Paper Mag. 24, no. 52:1581-1583 (Dec. 30, 1926).

Venneman, F. Removing and preventing the formation of scale by ionization phenomena. Mon. Papeterie Belge 6:229-233 (Apr., 1926); C. A. 20:3323.

Williams, R. B. How, when and where of boiler plant instruments. Paper Ind. 8, no. 1:57-59 (Apr., 1926).

Worm gear drives for paper machines. Pulp Paper Mag. 24, no. 48:1445-1447 (Dec. 2, 1926).

Yates, W. C. Recent developments in control equipment. Pulp Paper Mag. 24, no. 45:1347-1348 (Nov. 11, 1926).

Printing and Paper

Allan, J. S. Printing characteristics of paper. World's Paper Paper Trade Rev. 85, no. 6:474, 476 (Feb. 5, 1926). Trade Rev. 85, no. 6:474, 476 (Feb. 5, 1926).

Chapman, P. H. Printers and paper. World's Paper Trade Rev. 86, no. 25:2026, 2028 (Dec. 24, 1926).

Cunane, T. A. Printing papers. Paper Maker 71, no. 1:51-52 (Jan., 1926).

Davies, A. E. Moisture in paper. World's Paper Trade Rev. 86, no. 26:2026, 2028 (Dec. 24, 1926).

Lithographer's troubles with paper. World's Paper Trade Rev. 85, no. 15:1156 (Apr. 9, 1926).

Rollins, J. Colored printing of paper and cardboard by means of engraved rubber rolls. Papier 28:1347-1351 (Dec., 1925); T. S. 83:54.

Shantz, W. S. The art of printing and its affiliation with paper making. Paper Mill 49, no. 20:10, 12, 38 (May 8, 1926).

Pulp Testing

American rules for testing wood pulp. Paper Maker, Annual no., 1926:92-95.

Aribert, M., and Fallot M. Electric oven for determining the moisture content of pulp, designed at the French School of Papermaking, Grenoble. Papier 28:1303-1305 (Dec., 1925); Paper Trade J. 82, no. 22:52 (June 3, 1926); T. S. 83:120, 163.

Barnes, F. The freeness test for sulphite and groundwood pulp. Pulp Paper Mag. 24, no. 4:105-107, 123 (Jan. 28, 1926); C. A. 20:1322; T. S. 83:51.

Bentzen, Th. Air dry weight of wood pulp. World's Paper Trade Rev. 85, no. 3:228, 230 (Jan. 15, 1926).

Bentzen, Th. Evaluation of sulphite pulp. Paper Trade J. 82, no. 8:197, 199,201, 203 (Feb. 25, 1926); Paper Mill 49, no. 9:116, 118, 120, 122, 124 (Feb. 27, 1926); Paper Ind. 7, no. 12:2003-2009 (Mar., 1926); Tech. Assoc. Papers 9:53-55 (1926); C. A. 20:1516; T. S. 83:8.

Bentzen, Th. More about evaluation of sulphite pulp. Paper Trade J. 83, no. 22:48-49 (Nov. 25, 1926).

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Cameron, D. A., and Phelps, M. W. The hardness of sulphite pulps. Pulp Paper Mag. 24, no. 39:1170-1172 (Sept. 30, 1926); Paper Trade J. 83, no. 21:39-41 (Nov. 18, 1926); T. S. 83:240; C. A. 20:3808.

Cameron, E. P. Report of the Committee on physical and chemical standards. Pulp Paper Mag., Intern. no., 1926:132-133; T. S. 83:120; C. A. 20:2070.

Cameron, E. P. Standard freeness tester. Description of the freeness testing apparatus as standardized by the sub-committee on standardization (Canadian Pulp and Paper Asso.). Paper Trade J. 82, no. 7:49-52 (Feb. 18, 1926); T. S. 83-120.

Dryness determination of groundwood which has been subjected to hydraulic pressure. Zellstoff u. Papier 6:76-77 (1926); T. S. 83: 121; C. A. 20: 2747.

Freeness testing. Paper Ind. 8, no. 6:999-1000 (Sept., 1926); T. S. 83:240.

Hall, G. Modern methods for determining the strength of cellulose. Svensk Pappers-Tid. 28, no. 17:448-451; no. 18:474-478; no. 19:503-504 (Sept. 15, 30, Oct. 15, 1926).

Helder, H. A. Use of the strip method for the sampling and testing of wood pulp for moisture. Paper Mill 49, no. 14:24, 26 (Apr. 3, 1926); Paper Ind. 8, no. 1:91-92 (Apr., 1926); T. S. 83: 120; C. A. 20:2070.

Korn, —. The phloroglucinol reaction with incompletely cooked sulphite pulp. Papierfabr. 24, no. 34:521-522 (Aug. 22, 1926); Wochbl. Papierfabr. 57, no. 34:935-936 (Aug. 21, 1926); Zellstoff u. Papier 6, no. 9:397-398 (Sept., 1926).

Libby, F. D. Evaluating pulp. Paper Trade J. 82, no. 22:49 (1926); T. S. 83:144; C. A. 20:3082.

Miller, R. N. Interpretation of results in testing sulphite wood pulp. Paper Trade J. 82, no. 16:48-51 (Apr. 22, 1926); Tech Assoc. Papers 9:134-137 (1926); T. S. 83:121; C. A. 20: 2069.

Miller, R. N. Method for determining the strength of sulphite wood pulps. Paper Trade J. 82, no. 16:44-47 (Apr. 22, 1926); Tech. Assoc. Papers 9:130-133 (1926); T. S. 83:121; C. A. 20:2069.

Ravizza, V. Testing the strength of cellulose. Boll. staz. sperm. ind. carta 5, no. 6:55-60 (June, 1926).

Roschier, H. Determination of the dry content of wood pulp compressed in a hydraulic press. Zellstoff u. Papier 6, no. 2: 76-77 (Feb. 1926).

Ruhlemann, F. The strength determination of pulp. Papierfabr. 24, no. 1:1-6 (Jan. 3, 1926); Zellstoff u. Papier 6. no. 1:24-26 (Jan., 1926); Paper Trade J. 82; no. 13:57-60 (Apr. 1, 1926); T. S. 83:52; C. A. 20:3565.

Schlumberger, E. A rapid method for the determination of the water content of sulphate pulp. Papierfabr. 24, no. 50:783-785 (Dec. 12, 1926.)

Schwalbe, H. Recent results on the strength determination of paper pulps. Papierfabr. 24, no. 31:465-468; no. 32:481-483 (Aug. 1, 8, 1926); Wochbl. Papierfabr. 57, no. 42:1151-1156; no. 43:1181-1184 (Oct. 16, 23, 1926); C. A. 20: 3813.

Testing kraft pulp for strength. TAPPI Special Reports 1:54-58 (1926).

Testing wood pulp. American rules. World's Paper Trade Rev. 85, no. 26:2020, 2022, 2024 (June 25, 1926).

Weighing, sampling and testing wood pulp. Paper Trade J. 82, no. 11:51-53 (Mar. 8, 1926); C. A. 20:2070; T. S. 83:120.

Wenzl, H. Whiteness measurements on bleached pulp samples. Papierfabr. 24, no. 27:409-410 (July 4, 1926); C. A. 20: 3809.

Pulp Wood

Baker, H. P. Future of the wood supply for the paper industry. Paper Mills 49, no. 25:16, 18, 36, 38 (June 19, 1926.)

Craig, R. D., Piche, G. C., and Zavitz, E. J. The present status of Canada's pulpwood resources and the progress of silviculture in the Dominion. Pulp Paper Mag. 24, no. 7:197-200 (Feb. 18, 1926).

Gilmour, J. D. Clear culling of pulpwood lands. Pulp Paper Mag. 24, no 7:195-196 (Feb. 18, 1926).

Giolma, F. British Columbia's pulp wood resources. Paper Trade J. 82, no. 8:101-102 (Feb. 25, 1926.)

Gordon-Smith, G. Jugoslav wood production for making cellulose, Paper Trade J., 83, no. 8:55-56 (Aug. 19, 1926)

Kress, O., Humphrey, C. J., Richards, C. A., Bray, M. W., and Staidl, J. A. Control of decay in pulp and pulp wood. U. S. Dept. Agr., Bull. 1298. 1926. 80 p. Cf. C. A. 20:2072.

Pumps

Doty, E. F., and Klosson, M. M. Pumping paper stock. Pulp Paper Mag. 24, no. 26:757-760 (July 1, 1926); T. S. 83:213.

Hoyer, F. Rotating and centrifugal pumps for the paper industry. Papierfabr. 24., no. 23:341-347 (June 6, 1926).

Hoyer, F. Turbine pumps in the paper industry. Papierfabr. 24, no. 25:381-384 (June 20, 1926).

Triple stuff pump. Super-Calender 15, no. 10:686-688 (May, 1926).

Rags

Kantner, W. Influence of heat of hydration of lime and the insulation of the digester on the decrease of steam consumption in cooking rags. Wochbl. Papierfabr, 57, no. 27:732-735 (July 3, 1926).

Raw Materials

African woods for paper making. Wochbl. Papierfabr. 57, no. 51:1425 (Dec. 18, 1926).

Berges, A. Paper making woods and their substitutes. Ind. papeterie 5:145-154 (1926); C. A. 20:3080.

Bishop, R. O. Report of the chemical examination of fibers from the bark of terap, tutor and baru. Malayan Agr. J. 13:382-386 (Dec. 1925); C. A. 20:1516; T. S. 83:9.

Chippero, A., and Oglietti, B. Cellulose from chestnut wood residues from the manufacture of tannin extracts. Il notiziaro chem. industraile 1:19 247-248; (1926) C. A. 20:2411, 3236; Papeterie 48:954-8 (Oct. 25, 1926).

Cyrén, O. Eucalyptus varieties as raw materials from cellulose. Medd. Sveriges Kem. Ind.-kontor 9:64-70 (1926); C. A. 20: 2907.

Doubledent, F. French alfa paper. Papyrus, May, 1926:346; Papierfabr. 24:715.

Ellis, E. T. Waste products as papermaking materials. Paper Making 44, no. 12:496-498 (Dec., 1926).

Esparto grass. World's Paper Trade Rev. 85, no. 12:948, 950 (Mar. 19, 1926).

Eucalyptus paper. Wochbl. Papierfabr. 57, no. 7:183-184 (Feb. 13, 1926); T. S. 83:92.

Fibrous plants in the paper industry. Paper Mill 49, no. 17:22 (Apr. 24, 1926).

Griffin, M. L. Flax for seed and fiber. Pulp Paper Mag. 24, no. 11:299-301 (Mar. 18, 1926); T. S. 83:92; C. A. 20:2069.

Heim de Balsac, F., Cercelet, M., Maheu, J., Dagand, G. S., and Heim de Balsac, R. Doum palm (*Hyphæne thebaica*, Mart). Bull agence gén. colonies 18:1038 (1925); Bull. Imp. Inst. 24:264-265; C. A. 20:3811; T. S. 83:214.

Heim de Balsac, F., Cercelet, M., Maheu, J., Dagand, G. S., and Heim de Balsac, R. Madagascar palms. Bull. agence gén. colonies 19:23 (1926); Bull. Imp. Inst. 24:266-267 (1926); T. S. 83:214; C. A. 20:3812.

Heim de Balsac, F., Cercelet, M., Maheu, J., Dagand, G. S., and Heim de Balsac, H. Matsia grass (*Sporobolus pyramidalis*, Beauv.). Bull. agence gén. colonies 18:1244 (1925); Bull. Imp. Inst. 24:265 (1926); T. S. 83:214; C. A. 20:3811.

Heim de Balsac, H., Cercelet, M., Dagand, G. S., and Heim de Balsac, H. Wood from the Ivory coast. Bull agence gén. colonies 18:520 (1925); Bull. Imp. Inst. 23:482 (1925); C. A. 20 1322.

Heim de Balsac, F., Maheu, J., and Cercelet, M. Importance

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of bahaka in paper making. Papyrus, May 1926:341; Papierfabr. 24:715.

Heintzlman, B. F. Alaska as a source of newsprint. Paper Mill 49, no. 9:34, 38, 40, 204 (Feb. 27, 1926); Paper Ind. 8, no. 1:53-57 (Apr., 1926).

Herzog, R. O. Recent progress in the knowledge of fibrous substances. Papierfabr 24, no. 10: 137-142 (Mar. 7, 1926); Zellstaff u. Papier 6, no. 4:165-166 (Apr., 1926) C. A. 20-2745; T. S. 83:92.

Lambrette, A. Production of paper and cardboard from peat. Papeterie 47:809-813, 901-905, 950-955, 990-994, 1052-1055, 1090-1094, 1134-1138 (Sept. 10-Dec. 25, 1925); T. S. 83:92; C. A. 20:1322.

McBain, B. T. Where America must look for its future paper supply. Paper Ind. 8, no. 9:1542-1544 (Dec., 1926).

Marsden, F. Raw materials in Madras. Paper Maker, Intern. no. 1925:68.

Michaud, J. The chemical composition of the wood of maritime pine (*Pinus maritimus*) Bull. inst. pin., no., 18:259-266 (Nov. 1925); no. 19:275 (Dec. 1025); no. 20:293 (Jan., 1926); no. 21:323 (Feb. 1926); Chimie et industrie 15:596-598 (1926); C. A. 20:2244.

Michel-Jaffard, R. Rag substitutes in the cellulose industries Chimie et Industrie, Special no.: 621-626 (Sept., 1926).

Micol de Portemont, J. Poplar in the Italian paper industry. Papier 29:417-423 (Apr. 1926).

Milsson, T. H. A critical study of southern pine fiber. Paper Mill 49, no. 49:4, 6 (Dec. 4, 1926).

Nigerian woods as papermaking materials. Paper Maker 72, no. 1:56 (July 1, 1926); Annual no., 1926:95; World's Paper Trade Rev. 86, No. 1; 42, 44, 46 (July 2, 1926); Bull. Imp. Inst. 24:8-14 (1926); T. S. 83:141; C. A. 20:3811.

Paoli, Louis. Esparto grass. Papierfabr. 24, Festheft: 110-111 (June 5, 1926); C. A. 20:3806.

Paper from eucalyptus wood. Papier-Ztg. 51, no. 98:2876 (Dec. 8, 1926).

Paper from yellow pine fiber. World's Paper Trade Rev. 86, no. 7:522 (Aug. 13, 1926).

Raitt, W. Sabai grass. World's Paper Trade Rev. 86, no. 15:1106 (Oct. 8, 1926).

Reifegerste, T. Banana paper. Wochbl. Papierfabr. 57, Sondernummer: 73-75 (June 12, 1926); C. A. 20:3812.

Routala, O., and **Sevón, J.** Digestion of spruce wood with dilute nitric acid. Cellulosechemie 7, no. 8:113-118 (Aug. 8, 1926); C. A. 21:320.

Schwalbe, C. G. The ageing of plant fibers. Papierfabr. 24, Festheft: 38-41 (June 5, 1926); C. A. 20:3806.

Sellergren, G. Native fibers not now used, which might be used in the paper industry. Svensk Pappers-Tid. 28:613 (1925); C. A. 20: 1516; T. S. 83:92.

Shaw, M. B., and **Bicking, G. W.** Stipa Ichu grass as a papermaking material. Paper Trade J. 83, No. 18:105-106 (Oct 28, 1926).

Skonophitz-Grabowsky, W. The root *glycyrhiza glandulifera uralensis* as raw material for paper making. Bum. Prom., 1926; no. 10; Wochbl. Papierfabr. 57:1427.

Some of the possible fibers for paper making. Paper Trade J. 82, no. 17:32 (Apr. 29, 1926.)

Substitute for poplar. TAPPI Special Report 1:14-17 (1926).

Tree bark for bank note paper. World's Paper Trade Rev. 85, no. 26:1970 (June 25, 1926).

Tschudi, H. Preparation of pulp from wood of eucalyptus species. Wochbl. Papierfabr. 57, no. 44:1217-1218 (Oct. 30, 1926).

U. S. Forest Service. Usefulness of fibrous plants in the paper industry. Technical Note no. 220, Apr. 15, 1926. 3 p. (mimeographed).

Value of fibrous plants for paper. Paper Mill 49, no. 21:38 (May 22, 1926).

Venkajee, T. Sabai grass as a papermaking material. Paper Trade J. 82, no. 22:54 (June 3, 1926); T. S. 83:141; C. A. 20:3566.

Vidal, L. Bald cypress (*Taxodium distichum*) pulp. Paper Ind. 7, no. 10:1605-1606 (Jan., 1926).

Vidal, L. Micrography of the celluloses obtained at the Technological Laboratory of Saigon. Mon. Papeterie Francaise 57:130-135, 159-160, 227-232, 271-280 (Mar. 15, Apr. 1, May 15, June 15, 1926).

Vidal, L., and **Aribert, M.** Papermaking qualities of water hyacinth (*Eichhornia crassipes*). Agronomie coloniale 13:252 (1925); Bull. Imp. Inst. 24:267-268 (1926); C. A. 20:3811; T. S. 83:224.

Voigt, A. West Australian laboratory tests with domestic plants for pulp production. Zellstoff u. Papier 6, no. 4:160-161 (Apr., 1926); T. S. 83:92; C. A. 20:2747.

Volkov, L. Pulp manufacture from wood of inferior quality. Zellstoff u. Papier 6, no. 2:75-76 (Feb., 1926); C. A. 20:2746; T. S. 83:92.

Refiners

Andrews, C. K. Refining ground wood tailings. Paper Mill 49, no. 9:102, 108 (Feb. 27, 1926); Paper Trade J. 82, no. 8:245 (Feb. 25, 1926); Tech. Assoc. Papers 9:76 (1926); T. S. 83:68.

Rue, J. D. The rod mill as a refiner and beater. Paper Trade J. 83, no. 24:43-44 (Dec. 9, 1926); Paper Mill 49, no. 45: 20, 22, 24 (Nov. 6, 1926).

Research

Cellulose industries building. Pulp Paper Mag. 24, no. 26: 761-767; no. 27:787-790 (July 1, 8, 1926).

Hoyer, F. New paper institute of the Friedrichs-Polytechnikum in Cöthen. Papierfabr. 24, no. 23a:106-109 (June 5, 1926).

Johnsen, B. Some fundamental problems in pulp and paper making. Pulp Paper Mag. 24, no. 23:669-672 (June 10, 1926); Paper Trade J. 83, no. 4:49-51 (July 22, 1926); T. S. 83:213.

Libby, C. E. The alliance of the university and the paper mill. Paper Mill 49, no. 42:10, 14, 16 (Oct. 16, 1926).

Paper investigations at the Bureau of Standards during the year 1923-1924. Papierfabr. 24, no. 9:128-132 (Feb. 28, 1926).

Paper research work of the U. S. Bureau of Standards during 1926. Paper Trade J. 83, no. 24:45-48 (Dec. 9, 1926).

von Possanner, —. The technical institute for paper at the Friederichs-Polytechnikum. Wochbl. Papierfabr. 57, Sondernummer:82-86 (June 12, 1926).

Raitt, W. Paper pulp plant at the Forest Research Institute. Summary of investigations on bamboos and grasses for paper pulps. Paper Maker, Intern. no., 1925:93-97.

Schmidt-Nielsen, S. Can trials in glass apparatus be used in the study of industrial processes? Svensk Pappers-Tid. 29, no. 7:158-161; no. 8:186-188 (Apr. 15, 30, 1926); C. A. 20:3806.

Schwalbe, C. G. For the organization of the scientific investigation of plant fibers. Kolloid-Z. 39:178-180 (1926); C. A. 20:3806.

Schwalbe, C. G. The experiment station for wood and pulp chemistry in Eberswalde, and extension institute for the technical university in Berlin. Wochbl. Papierfabr. 57, no. 8:205-211 (Feb. 20, 1926); Papierfabr. 24, no. 11:157-161 (Mar. 14, 1926); C. A. 20:2748.

Testing, analytical and research laboratories of the French School of Paper Making. Industrie papeterie 4:374-376 (1925); 5:15-19 (1926); C. A. 20:1323; T. S. 83:84.

Venkajee, T. The Forest Research Institute at Dehra Dun. Pulp Paper Mag. 24, no. 37:1120, 1122-1123 (Sept. 16, 1926); Paper Trade J. 83, no. 16:45-46 (Oct. 21, 1926).

Wise, L. E. The great cooperative experiment at Montreal. Paper Ind. 8, no. 5:816-817 (Aug., 1926).

Wise, L. E. Interesting pulp and paper laboratories of Europe. I. London: The laboratories of Cross and Bevan. Paper Ind. 8, no. 7:1155-1159 (Oct., 1926). II. London and Paris—Papermaking courses at Battersea Polytechnic; research on lignin at Chelsea; papermaking exhibits at the "Conservatoire National" in Paris. *ibid.* no. 8:1345-1348 (Nov., 1926). III. Grenoble,

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France—The French School of Papermaking. *ibid.* no. 9:1535-1541 (Dec., 1926).

Winslow, C. P. What the Forest Products Laboratory can contribute to the industry with the aid of the advisory committee. Paper Mill 49, no. 21:14 (May 15, 1926).

Rifflers

Gerhards, A. Experimental results with rifflers in the pulp industry. Wochbl. Papierfabr. 57, no. 13:357-359 (Mar. 27, 1926); T. S. 83:121a.

Rifflers and the dirt problem in chemical pulp. TAPPI Special Reports 1:58-61 (1926).

Rolls

Adams, R. B. Rubber covered press rolls. World's Paper Trade Rev. 85, no. 3:210, 212, 214 (Jan. 15, 1926).

Becker, G. The proper performance of rubber rolls on the paper machine. Wochbl. Papierfabr. 57, no. 35:969-970 (Aug. 28, 1926); Zellstoff u. Papier 6, no. 9:400-401 (Sept., 1926).

Brown, W. E. Rubber covered rolls. World's Paper Trade Rev. 86, no. 20:1542 (Nov. 12, 1926).

Gurney, H. P., and **Cameron, F. P.** Technical problems connected with rubber coverings of iron rolls. India Rubber J. Apr. 3, 10, 1926; Pulp Paper Mag. 24, no. 40:1193-1197 (Oct. 7, 1926); Super-Calender 15, no. 11:690-697 (June, 1926).

Houwink, R. Rubber rolls for the paper and textile industry. Zellstoff u. Papier 6, no. 2:79-81 (Feb., 1926); T. S. 83:144.

Klemm, P. Properties of paper and the paper machine. Wochbl. Papierfabr. 56:1544-1546 (Dec. 19, 1925); T. S. 83:122.

Krause, E. Hints on the use of suction rolls. Zellstoff u. Papier 6, no. 6:255 (June, 1926).

New type Farrell roll grinder. Paper Trade J. 83, no. 4:53 (July 22, 1926); Paper Mill 49, no. 30:4 (July 24, 1926); Pulp Paper Mag. 24, no. 31:1908-1909 (Aug. 5, 1926); T. S. 83:249.

Pemberton, W. G. Rubber covered rolls. World's Paper Trade Rev. 86:2002, 2004 (Dec. 24, 1926).

Rollins, J. Colored printing of paper and cardboard by means of engraved rubber rolls. Papier 28:1347-1351 (Dec., 1925).

Schmid, W. Preparation and treatment of felt covered rolls. Papierfabr. 24, no. 45:695-697 (Nov. 7, 1926).

Todd, F. A. The manufacture of rubber covers for press rolls. Pulp Paper Mag., Intern. no., 1926: 111-116; Making Paper 8, no. 11:390-396 (May, 1926); T. S. 83:164.

Safety

National Safety Council. Safety code for paper and pulp mills, National Safety Council, sponsor. Tentative American standard, approved December 8, 1925, American engineering standards committee. April, 1926. Bulletin of the U. S. Bureau of Labor Statistics, No. 410. 37 p. Reviewed in Pulp Paper Mag. 24:1443.

Sand Trap

Belani, E. The sand trap. Wochbl. Papierfabr. 57, Sondernummer:79-81 (June 12, 1926).

Fleming, M. C. The Hardinge sand filter. Paper Mill 49, no. 39:10 (Sept. 25, 1926); Paper Trade J. 83, no. 15:61 (Oct. 7, 1926).

Gerhards, A. Sand traps in pulp manufacture. Wochbl. Papierfabr. 57, no. 27:740 (July 3, 1926).

Gerhards, A. Results of tests of sand traps in the paper industry. Wochbl. Papierfabr. 57, no. 13:357-359 (Mar. 27, 1926).

Preparatory treatment of paper materials. Papierfabr. 24, no. 37:565 (Sept. 12, 1926).

Thorbjörnson, B. Sand trap. Svensk Pappers-Tid. 28, no. 5:106-108; no. 6:130-132 (Mar. 15, 31, 1926); Papierfabr. 24:540.

Voigt, S. Experimental results with sand traps in the pulp industry. Wochbl. Papierfabr. 57, no. 20:564 (May 15, 1926).

Save alls

Arledter, F. Recovery of fibers and fillers from waste waters. Zellstoff u. Papier 6, no. 6:260-261 (June, 1926).

Becker, F. K. Rotary screens and save alls. World's Paper Trade Rev. 86, no. 3:224 (July 16, 1926); Paper Mill 49, no. 9: 842 (May 1, 1926); T. S. 83:121a.

Elimination of white water losses in paper mills with Oliver save alls. Pulp Paper Mag. 24, no. 2:31-33 (Jan. 14, 1926); T. S. 83:75.

Fatijew, S. Recovery of fibers from waste waters. Bum. Prom. 1926, no. 4; Papierfabr. 24:603.

Gery, W. B. "Save all savings." Paper Trade J. 83, no. 18: 107-110 (Oct. 28, 1926).

Kuhn, A. D. J. The patented cellular (Zellenfilter) devices of R. Wolf, A.-G. Wochbl. Papierfabr. 57:806-807 (July 17, 1926); Zellstoff u. Papier 6:364 (Aug., 1926).

Niks, N. J. Dorr saveall operation; book papers. Paper Ind. 8:464, 467 (1926); Paper Trade J. 82, no. 24:50 (1926); C. A. 20:3081; T. S. 83:204.

See also White water.

Screens

Becker, F. K. Application of rotary screens and savealls to filling requirements. Paper Mill 49, no. 19:8, 42 (May 1, 1926); World's Paper Trade Rev. 86, no. 3:224 (July 16, 1926); T. S. 83:121a.

Haug, A. J. A new step in pulp screening. Paper Trade J. 82, no. 10:48-52 (Mar. 11, 1926); Tech. Assoc. Papers 9:87-91 (1926); T. S. 83:121a.

Lamort, E. Screening in the paper industry. Papier 29, no. 1:83-86 (Jan., 1926); T. S. 83:120a

Leonhardt, K. Board machine with large cylindrical screen. Wochbl. Papierfabr. 57, no. 16:439-442 (Apr. 17, 1926); T. S. 83:121a.

Marburg, L. C. The Biffar combined refiner and screen. Paper Trade J. 82, no. 8:239, 241 (Feb. 25, 1926); Paper Ind. 7, no. 12:2011, 2015, 2017 (Mar., 1926); Tech. Assoc. Papers 9:73-74 (1926); T. S. 83:68.

Maurice Cartiaux, Fils. Screening in the board industry. Papier 29, no. 1:89-92 (Jan., 1926).

Self contained, direct connected motor driven pulp screen. Pulp Paper Mag. 24, no. 1:7-8 (Jan. 7, 1926); T. S. 83:68.

Semi-Chemical Process

Rue, J. D., Wells, S. D., Rawling, F. G., and **Staidl, J. A.** A semi-chemical pulping process. Paper Mill 49, no. 38:10, 12, 39-40 (Sept. 18, 1926); Paper Trade J. 83, no. 13:50-53 (Sept. 23, 1926); Pulp Paper Mag. 24, no. 39:1163-1167 (Sept. 30, 1926); Paper Ind. 8, no. 8:1380a-d (Nov., 1926); T. S. 83:242.

Rue, J. D. Semi-cellulose and semi-chemical pulping. Tech. Assoc. Papers 9:140-142 (1926).

Sizing

Albrecht, U. Action of hygroscopic moisture of paper on its size fastness. Pap. och Travarutidskr. no. 10:282 (1926); Papierfabr. 24:619; Wochbl. Papierfabr. 57:833-834.

Albrecht, U. Determination of the degree of sizing of paper. Pulp Paper Mag. 24, no. 36:1065 (Sept. 9, 1926); Zellstoff u. Papier 6, no. 9:396-397 (Sept., 1926); T. S. 83:241.

Arledter, F. Paper sizing. Zellstoff u. Papier 6, no. 6: 259-260 (June, 1926).

Arnould, E. Reason of defective sizing. Paper Maker, Annual no., 1926: 29-30.

Blasweiler, Th. E. The use of sodium silicate for the sizing of paper. New York, Van Nostrand, 1926, 133 p. Reviewed in World's Paper Trade Rev. 86:34; Paper Making 45:271.

Calcium carbonate and rosin sizing. TAPPI Special Reports 1:29-31 (1926).

Carson, F. T. Measurement of the degree of sizing of paper. U. S. Bureau of Standards, Tech. Paper no. 326. 1926. 30 p.

Chintschin, —. Rosin sizing with hard water. Bum. Prom.

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1926, no. 4; Papierfabr. 24:600; Wochbl. Papierfabr. 57:972; Zellstoff u. Papier 6, no. 11:429-430 (Oct., 1926).

Continuous tub sizing of paper. Papeterie 48:810-817 (Sept. 10, 1926); T. S. 83:241.

Determination of the nature of rosin sizing in paper. Zellstoff u. Papier 6, no. 5:203-206 (1926); T. S. 83:112; C. A. 20: 2746.

Eastman, H. M. Sizing factors. Paper Mill 49, no. 27:10-12 (July 3, 1926); World's Paper Trade Rev. 96, no. 12:900, 902 (Sept. 17, 1926); C. A. 20:3083; T. S. 83:173.

Enckell, J. Rosin troubles in paper making. Paper Ind. 8, no. 2:279, 281, 283 (May, 1926).

Gottlöber, M. The analysis of rosin size. Papierfabr. 24, no. 9; 125 (Feb. 28, 1926); T. S. 83:112; C. A. 20:2746.

Hamill, G. K., Gottschalk, V. H., and Bicking, G. W. Surface sizing of paper with glue. Paper Trade J. 83, no. 23:39-43 (Dec. 2, 1926).

Johnstone, E. J. Origin of rosin and size. Paper Mill 49, no. 27:6, 16 (July 3, 1926).

Munds, E. The influence of glue top-sizing on the properties rosin and starch sized papers. Wochbl. Papierfabr. 57, no. 32: 883-887 (Aug. 7, 1926); C. A. 20:3813.

Oeman, E. Aluminium resinate in the rosin sizing of paper. Papierfabr. 24, no. 27:410-413; no. 30:451-455 (July 4, 25, 1926); C. A. 20; 3813.

Oeman, E. The colloidal nature of sizing with resins. Svensk Pappers-Tid. 28, no. 4:82-84 (Feb. 28, 1926); Papierfabr. 24:604; T. S. 83:112; C. A. 20:1521.

Oeman, E. Effect of iron in sizing paper with resins. Svensk Pappers-Tid. 27: 483-484, 508-509 (1925); C. A. 20:1521: T. S. 83:112.

Oeman, E. Sizing paper with resin. Svensk Pappers-Tid. 27:534-537, 561-563, 585-587, 611-612 (1925); T. S. 83:112; C. A. 20:1521.

Oeman, E. Theory of rosin sizing. Papierfabr. 24, no. 4:49-58 (Jan. 24, 1926); T. S. 83:112; C. A. 20:2746.

Paper sizing. Paper Maker, Intern. no., 1925:67-68.

Rosin production and use, 1925. Paper Trade J. 83, no. 27:42 (Dec. 20, 1926).

Rosin supply of Finland and the question of a rosin substitute. Wochbl. Papierfabr. 57, no. 14:392-393 (Apr. 3, 1926); C. A. 20:2746; T. S. 83:112.

Schwalbe, C. G. Theory of rosin sizing. Papierfabr. 24, no. 10:142 (Mar. 7, 1926); C. A. 20:2746; T. S. 83: 112.

Shaw, D. N., and Sebrell, L. B. Chemical composition of rosin. Ind. Eng. Chem. 18:612-614 (June, 1926); T. S. 83:173.

Sizing and the temperature of the stock. TAPPI Special Reports 1:48-50 (1926).

Surface sizing of paper. Paper Trade J. 83, no. 7:54 (Aug. 12, 1926).

Taylor, W. A. The A B C of hydrogen ion control in paper manufacturer. Paper Mill 49, no. 23:30, 32, 50 (June 5, 1926); C. A. 20:3081; T. S. 83:213.

Taylor, W. A. The application of hydrogen ion control to the manufacture of pulp and paper. Paper Trade J. 82, no. 8:166-167, 169, 171, 173, 177 (Feb. 25, 1926); Paper Mill 49 no. 9:170-184 (1926); Paper Ind. 7, no. 12: 1983, 1985, 1987, 1989, 1991, 1993 (Mar., 1926); C. A. 20: 1519.

Thiriet, A., and Delcroix, P. Technic of the use of rosin size in paper making. Chimie et industrie, Special no. 508-512 (Sept., 1925); Pulp Paper Mag. Canada 24, no. 14:393-396 (Apr. 8, 1926).

Thompson, L. A. Rosin size organization. Paper Mill 49, no. 27: 8, 42 (July 3, 1926).

Turner, E. J. Side lights on rosin production. Paper Trade J. 83, no. 23:44-45 (Dec. 2, 1926).

Uzac, R. Rosin sizing. Rev. gen. colloides 4:257-262 (Sept., 1926); Paper Ind. 8, no. 9:1554 g-h (Dec., 1926).

Water resistant folder stock. TAPPI Special Reports 1:87-89 (1926).

Slitters and Winders

Cameron, J. A. Importance of correct location of slitters in slitting and roll-winding machines. Brooklyn, Cameron Machine Co., 1926. 13 p. In part in Paper Trade J. 83, no. 4:54-58 (July 22, 1926); Paper Mill 49, no. 31:4, 41, 42, 44, 46 (July 31, 1926); Pulp Paper Mag. 24, no. 31:903-907 (Aug. 5, 1926); Paper Maker, Annual no., 1926:42-43, 47, 49, 51, 52.

Hauser, A. Rolls. Wochbl. Papierfabr. 57, Sondernummer: 75-77 (June 12, 1926).

Soda Process

Black ash waste in soda pulp mills. TAPPI Special Reports 1:125-127 (1926).

Cable, D. E., McKee, R. H., and Simmons, R. H. Apparatus and method for experimental investigations of the production of soda pulp. Paper Trade J. 82, no. 8:158-161 (Feb. 25, 1926); Paper Mill 49, no. 9:138, 140, 142, 144 (Feb. 27, 1926); Tech. Assoc. Papers 9:30-32 (1926); T. S. 83:42; C. A. 20:1517

Cable, D. E., McKee, R. H., and Simmons, R. H. Soda pulp investigations. I. Yield and quality of pulp as affected by length of chip. Paper Trade J. 83, no. 14:47-49 (Sept. 20, 1926); Pulp Paper Mag. 24, no. 42:1249-1252 (Oct. 21, 1926); T. S. 83:233; C. A. 20:3810.

Griffin, M. L. Chemistry on the soda pulp process. Paper Maker 72, no. 3:295-296, 298 (Sept. 1, 1926).

Hägglund, E. Technik und Praxis der Papierfabrikation. III. Die Fabrikation des Zellstoffes aus Holz. Teil 2. Natronzellstoff. Berlin, Elsner, 1926. 360 p. Review in Pulp Paper Mag. 24:1385.

Jenke, —. Ungerer's system for digesting wood by the soda process. Ver. Zellstoff u. Papier-Chem., Hauptversamml., 1924:177-180; T. S. 83:122; C. A. 20: 2069.

Jenssen, L. D. Manufacture of soda pulp. Papir-Journalen 14, no. 15:179-183; no. 16:191-194 (Aug. 25, Sept. 11, 1926).

Kullgren, C. The variation in alkalinity during the cooking of soda and sulphate pulps. Teknisk Tids. 22;174 (1925); Papierfabr. 24, no. 2:20-23 (Jan. 10, 1926); T. S. 83.42; C. A. 20:1517.

Munro, W. C. Modern soda pulp mill operations. Pulp Paper Mag., Intern. no., 155-150 (Feb., 1926); Paper Ind. 7 no. 11; 1769-1771 (Feb., 1926); T. S. 83:102; C. A. 20:2071.

Ruby, A. Rate of the disincrusting reaction in the cooking of wood by the soda process. Papier 29:869-870 (Aug., 1926); Pulp Paper Mag. 24, no. 47:1421-1424 (Nov. 25, 1926).

Sulphur in soda pulp cooking. TAPPI Special Reports I: 61-67 (1926).

Wagner, C. L. Wagner stationary recovery furnace for soda and sulphate mill chemical recovery. Paper Trade J. 82, no. 8:177, 179 (Feb. 25, 1926); Paper Mill 49, no 10:10, 44 (Mar. 6, 1926); Tech. Assoc. Papers 9:43-44 (1926); C. A. 20:1521; T. S. 83:43.

Wood, E. P. Modern soda pulp mill. Paper Trade J. 82, no. 8:147-150 (Feb. 25, 1926); Paper Mill 49, no. 9:162, 164 (Feb. 27, 1926); Tech. Assoc. Papers 9:19-22 (1926); T. S. 83:42.

Special papers

Altmann, P. E. Metallized paper. Papierfabr. 24, no. 41: 630-631 (Oct. 10, 1926).

Arnould, E. Special moistening of chromo papers. L'Industrie papeterie 5:11-15 (Jan., 1926); T. S. 83.54.

Bart, J. Means of increasing the combustibility of paper. Papeterie 48:18 (1926).

Bonnet, G. Filter mass. World's Paper Trade Rev. 85, no. 19: 1498, 1500, 1502 (May 7, 1926).

Bouvier, L. Preparation of electric insulating materials from hardened impregnated papers. Rev. gen. mat. plastiques 2:383-387 (1926); Paper Trade J. 83, no. 9:51-54 (Aug. 26, 1926).

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Bouvier, R., and Vidal, L. Khanbaligh and some other ancient Asiatic papers. Pulp Paper Mag. Intern. no., 99-102 (Feb., 1926); Paper Maker, Annual no., 1926:81-82; Making Paper 9, no. 2:42-46 (Aug., 1926); T. S. 83:112a.

Cellophane. Wochbl. Papierfabr. 57, no. 36:998-999 (Sept. 4, 1926); C. A. 20:3810.

Dittmer, —. Comparative investigations with tar roofing papers. Teer 24:141-146, 193-198, 227-231, 263-268 (1926); Papierfabr. 24; 732.

Drexler, H. Artificial wool manufacture. Paper Trade J. 83, no. 13:47-48 (Sept. 23, 1926).

Fachmann, —. Photographic paper. Zellstoff u. Papier 6, no. 10: 430-431 (Oct., 1926).

Freydier, H. The combustibility of cigaret papers. Industrie papeterie 5:19 (1926); C. A. 20:1321; T. S. 83:54.

Green, J. B. Hand made papermaking. World's Paper Trade Rev. 85, no. 17:1302, 1304, 1306, 1308 (Apr. 23, 1926); Paper Maker 71, no. 5:514-515 (May 1, 1926).

Hartung, W. J. The functions of paper mulch in pineapple culture. Hawaii, Hawaiian pineapple co., 1926. 31 p.

Hand made paper. Paper Maker, Annual No., 1926:55.

Herzberg, W. Standards for sack paper. Wochbl. Papierfabr. 57, no. 5:125 (Jan. 30, 1926); Papierfabr. 24, no. 6:92-93 Feb. 7, 1926); Zellstoff u. Papier 6, no. 3:126-127 (Mar., 1926); Mitt. Materialprüfungsamt Berlin-Dahlem, n. f., no. 2:36-37 (1926); T. S. 83:118a.

Increasing the combustibility of cigaret paper. Papeterie 48:18, 21 (1926); Zellstoff u. Papier 6 no. 4:171-172 (Apr., 1926); Paper Trade J. 82, no. 21:60 (May 27, 1926); T. S.83:120, 204; C. A. 20:1321, 2748.

Influence of high degree of heat on the strength properties of sack paper. Mitt. Materialprufüngsant Berlin-Dahlem, n. f., no. 3:66-69 (1926).

Keghel, M. de. The manufacture of parchment paper. Papyrus 6:498-501, 824-826 (1925); 7.27-30 (1926); Paper Trade J. 83, no. 10:57-62 (Sept. 2, 1926); C. A. 20:1519; T. S. 83:119a.

Kohler, G., and Hall, G. Investigations into the strength of writing paper. Pulp Paper Mag. 24, no. 15:423-424 (Apr. 15, 1926); Statens Provingsanstalt, Stockholm. Meddelande 28. 1925. 84 p.

Lambrette, A. Papier mache compositions. Industrie Papetiere 4:273, 275, 302-308, 337-340 (Sept., Oct., Nov., 1925; C. A. 20:988.

Lambrette, A. Waterproofing and hardening paper by means of aluminum acetate. Papeterie 48:666 (July 25, 1926). 10:4 (Mar. 6, 1926).

Mattas, K. J. Some practical experience in the manufacture of greaseproof paper. Suomen Paperi, No. 8; 1926; Pulp Paper Mag. 24, no. 9:1485 (Dec. 9, 1926); Paper Trade J. 83, no. 27:41 (Dec. 30, 1926); Wochbl. Papierfabr. 57:943; Papierfabr. 24: 523; Zellstoff u. Papier 6, no. 8:355 (Aug. 1925).

Moerbeek, B. H. Drawing paper manufacture. Wochbl. Papierfabr. 57, no. 17:466-469 (Apr. 24, 1926).

Postl, H. Needle paper. Papierfabr. 24, no. 2:23 (Jan. 10, 1926); T. S. 83:118a; C. A. 20:1518.

Reed, R. F. Lithography and paper. Paper Mill 49, no. 10.4 (Mar. 6, 1926).

Reifegerate, T. Tori-Kusa paper. Wochbl. Papierfabr. 57, no. 13:359-360 (Mar. 27, 1926); T. S. 83:112a.

Scott, J. Anti-falsification paper. Paper Maker, Annual no., 1926:75-77; C. A. 20:3812.

Scott, J. Anti-falsification paper. Paper Maker. Annual no., 71: Pulp Paper Mag. 24, no. 36: 1061-1064 (Sept. 9, 1926); C. A. 20-3812.

Scott, J. Iodine paper, its manufacture and peculiar chemistry. Paper Maker, Intern. no., 1925:81, 83, 85.

Scribner, B. W. Standards for paper towels. U. S. Bureau of Standards, Circular no. 294; Pulp Paper Mag. 24, no.4:103 (Jan. 28, 1926); Zellstoff u. Papier 6, no. 4:171 (Apr., 1926); T. S. 83:55.

Scribner, B. W., and Carson, F. T. A study of case-lining papers for the purpose of developing standard specifications. U. S. Bureau of Standards, Tech. paper no. 312. 10 p. Pulp Paper Mag. 24, no. 20:565-568 (May 20, 1926); T. S. 83:203; World's Paper Trade Rev. 85, no. 23:1744; 86, no. 6:385-386, 388, 390; no. 7:498, 500 (June 4, Aug. 6, 13, 1926); C. A. 20:3082.

Shaw, M. B., and Bicking, G. W. Research on the production of currency paper in the Bureau of Standards experimental paper mill. U. S. Bureau of Standards Tech. Paper no. 329. 1926. 20 p.

Specifications for index bristol. TAPPI Special Reports 1:117-119 (1926).

Testing currency paper. Paper Mill 49, no. 22:20 (May 29, 1926).

Vander-Stichel, A. Contents of an old sample book (black paper). Paeterie 48, no. 1:32 (Jan. 10, 1926); T. S. 83:112a.

Venkajee, T. Hand made paper industry in India. Paper Trade Jr. 83, no. 18:101-104 (Oct. 28, 1926).

de Villiers, F. J. Physical and chemical analyses of papers employed for wrapping fruit. Dept. Agr., Union of South Africa, Sci. Bull. 47, 1926. 19 p. In part in Pulp Paper Mag. 24, no. 29: 853-854; no. 34:989-990 (July 22, Aug. 26, 1926).

Wells, S. D. Nu-Process egg case fillers. Paper Trade J. 82, no. 18:60-62 (May 6, 1926); C. A. 20:2072;T. S. 83:118a.

What is a wrapping paper. World's Paper Trade Rev. 86, no. 9:682, 684 (Aug. 27, 1926).

Whatman papers and their manufacture. World's Paper Trade Rev. 85, no. 17:1338-1343 (Apr. 23, 1926); T. S. 83:112a.

Standardization

Hazell, W. H. Standardization of paper. World's Paper Trade Rev. 85, no. 2:100, 102; no. 3:172 (Jan. 8, 15, 1926); cf. no. 7:532, 534 (Feb. 12, 1926); no. 9:690, 692 (Feb. 26, 1926).

Standardizing tissue papers. World's Paper Trade Rev. 85, no. 5:362 (Jan. 29, 1926).

Statistics

Cadman, A. E. Graphic review of the industry. Pulp Paper Mag. 24, no. 11:310-311 (Mar. 18, 1926).

Cellulose industry in Finland. Paper Ind. 8, no. 8:1380 (Nov., 1926).

Coats, R. H., and Lewis, R. G. The pulp and paper industry in 1925. Pulp Paper Mag. 24, no. 43:1293 1295 (Oct. 28, 1926).

German paper industry. World's Paper Trade Rev. 86, no. 7: 468, 470, 472 (Aug. 20, 1926).

Hagstrom, H. G. International pulp and paper statistics. Svensk Pappers-Tid. 28:279-280 (1926); C. A. 20:3811.

McGurk, J. F. Pulp and paper in Finland. Paper Mill 49, no. 45:14, 16 (Oct. 30, 1926).

Paper trade statistics. World's Paper Trade Rev. 86, no. 9: 658, 660, 662; no. 16: 1218, 1220, 1222 (Aug. 27, Oct. 15, 1926).

Pulpwood consumption and woodpulp production. Paper Trade J. 82, no. 8:69, 71 (Feb. 25, 1926).

U. S. pulp and paper industry. World's Paper Trade Rev. 86, no. 10: 738, 740, 742; no. 11:838, 840, 842, 844 (Sept. 3, 10, 1926).

Stock Regulators

Boivin stock regulator. Paper Trade J. 82, no. 5:65 (Feb. 4, 1926); T. S. 83.75.

Consistency regulators. TAPPI Special Reports I:119-125 (1926).

Schwalbe, H. The control of stock concentration. Wochbl. Papierfabr. 57, Sondernummer: 70-72 (June 12, 1926); C. A. 20:3809.

Stream Pollution

Edwardes, V. P. Pulp and paper mill discharge in relation to the purity of streams. Paper Mill 49, no. 24:10, 12, 42 (June

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12, 1926); Paper Trade J. 82, no. 24:43-46 (June 17, 1926); C. A. 20:3080; T. S. 83:143.

Monger, J. E. Administrative phases of stream pollution control. Paper Trade J. 83, no. 12:49-52 (Sept. 16, 1926).

Rothchild, H. A. Stream pollution and paper mills. Paper Trade J. 82, no. 4:47-49 (Jan. 28, 1926); T. S. 83:84.

Rothchild, H. A. Stream pollution and the paper mill owner. Paper Mill 49, no. 22:10, 46 (May 29, 1926).

Stream pollution bibliography. Paper Trade J. 82, no. 12:47-48 (Mar. 25, 1926).

Straw

Altmann, P. Absorptive paper and board from straw. Zellstoff u. Papier 6, no. 10:432 (Oct., 1926).

Fournier, Raymond. Preliminary treatment of vegetable materials, particularly of straw. Papeterie 48:1105-1109 (Dec. 10, 1926).

Hoyer, F. Die Strohzellstoffabrikation. Berlin, Krayn, 1926. 342 p. Reviewed in World's Paper Trade Rev. 86:1610.

Oddon, J. The manufacture of paper from straw. Papier 29:841-847, 973-978 (Aug., Sept., 1926); Pulp Paper Mag. Canada 24, no. 50: 1505-1508, 1528 (Dec. 16, 1926).

Rue, J. D., and Monsson, W. New method for preparation of straw paper. Paper Trade J. 81, no. 15:52-53; no. 20:49 (1925); Papierfabr. 24, no. 12:169-172 (Mar. 21, 1926).

Sulphate process

Haegglund, E. The odor question in sulphate pulp manufacturer. Paper Trade J. 83, no. 25:50 (Dec. 16, 1926); Pulp Paper Mag. 24, no. 46:1381-1382 (No. 18,1926).

Hoyer, F. Steaming and cooking wood for brown pulp. Papierfabr. 24, no. 43:658-659 (Oct. 24, 1926).

Klein, A. St. Alkali requirements in the production of wood pulp. Zellstoff u. Papier 6, no. 2:70-71 (Feb., 1926); T. S. 83:101; C. A. 20:2745.

Kullgren, C. Changes in the alkalinity of liquor during cooking of soda and sulphate pulp. Papierfabr. 24, no. 2:20-23 (Jan. 10, 1926); T. S. 83:42.

Kullgren, C. The absorption of sodium hydroxide by sulphate pulp from caustic soda solutions and black liquor. Papierfabr. 24, no. 11:153-155; no. 13: 186-189; no. 14:206-209 (Mar. 14, 28, Apr. 4, 1926); T. S. 83:101; C. A. 20:2745.

Oeman, E. Modern control system in producing sulphate pulp. Svensk Pappers-Tid 28, no. 11:286 (June 15,1926); C. A. 20:3807.

Routala, O., and Jaartela, A. V. The adsorption of the odors resulting in the preparation of sulphate pulp. Cellulosechemie 7, no. 12:169-173 (Dec. 12, 1926).

Schwalbe, C. G. A new Swedish discovery in the sulphate industry. Papierfabr. 24, no. 34:515-516 (Aug. 22, 1926); C. A. 20:3810.

Sieber, R. Alkali loss in sulphate pulp manufacture. Papierfabr. 24, no. 1:6-7 (Jan 3, 1926); T. S. 83:42; C. A. 20:1519.

Sunblad, G. Heat problems in cellulose manufacture. Arch. Warmewirtschaft 5:111-114 (1924); C A. 20:3806.

Sunblad, G., and Harlin, A. Fuel requirements of the sulphate pulp industry. Svensk Pappers-Tid. 28:61-62 (1926); T. S. 83:102; C. A. 20: 1517.

Thorsen, K. M. Heat problems in the sulphate mill. Paper Trade J. 82, no. 5:62-65 (Feb. 4, 1926); Papierfabr. 24, no. 41: 627-630 (Oct. 10, 1926); T. S. 83: 43; C. A. 20:1322.

Black Liquors and other by-products

Dittmer, M. Tall oil, a by-product of sulphate pulp manufacture. Z. angew Chem. 39:262-269 (1926); C. A. 20: 2072.

Hasselstroem, T. The fatty acids in pine oil obtained as a by-product in the manufacture of sulphate pulp. Pappers-och Trävarutidskrift för Finland, 1925, no. 25:632-638; Paper Trade J. 83, no. 2:60-64 (July 8, 1926); T. S. 83: 223; C. A. 20:3566.

Kylander, Y. By-products of the pulp manufacture. Suomen Paperi-ja Puutavaralehti, 1926, nos. 7-9; Wochbl. Papierfabr. 57:1023-1924.

von Lassberg, —. Waste liquor evaporation. Papierfabr. 24, no. 4:58-61 (Jan. 24, 1926); T. S. 83:102.

Moore, H. K. Evaporators for black liquor and sulphite waste liquors. Paper Trade J. 83, no. 20:45-52 (Nov. 11, 1926).

Schrohe, A., and West, C. J. Waste liquors and gases of the paper industry. Tech. Assoc. Papers 9:146-181 (1926).

Wagner, C. L. Wagner stationary recovery furnace for soda and sulphate mill chemical recovery. Paper Trade J. 82, no. 8:177, 179, (Feb. 25, 1926); Paper Mill 49, no. 10:10, 44 (Mar. 6, 1926); Tech. Assoc. Papers 9:43-44 (1926); T. S. 83:43; C. A. 20: 1521.

Sulphite—General

Alfthan, H. Increasing production in sulphite mills. Mon. Papeterie Belge 6:335-336 (May, 1926); Paper Trade J. 83, no. 26:39-40 (Dec. 23, 1926); Papier 29:621-624 (June, 1926).

Alfthan, H. Capacity of sulphite digesters. Pap. och. Trävarutidskr. för Finland 8:229 (1926); Papierfabr. 24:459; W. P. 57:971.

August Harpf's gesammelte Werke. Zellstoff u. Papier 6, no. 1:40-42 (1926). Book review.

Brot, M. V., and Hirschel, M. Treatment of straw and of resinous woods with sodium sulphite and ammonium sulphite. Papier 29:75-80 (1926); Zellstoff u. Papier 6:161 (Apr., 1926): C. A. 20:1322; T. S. 83: 100; Paper Ind. 8:97-101 (1926); Chimie et Industrie, Special no.: 612-617 (Sept., 1926).

Causes of high sulphur consumption. TAPPI Special Reports 1:7-14 (1926).

Drewsen, V. The monosulphite process. Paper Trade J. 83, no. 24:41-42 (Dec. 9, 1926).

Funcke, J. Modern sulphite mills in Canada. Papierfabr. 24, no. 42:644-648 (Oct. 17, 1926).

Gerngross, Otto, and Tsou, Kingnor. The violet fluorescence of sulphite pulp and waste sulphite liquors. Papierfabr. 24, no. 33:497-499 (Aug. 15, 1926); C. A. 20:3808.

Goodwin, L. F., and Birchard, W. H. The effect of catalysts in the manufacture of sulphite pulp. Paper Ind. 8, no. 4:617-620 (July, 1926); T. S. 83:223; C. A. 20:3565.

Hägglund, E. Chemistry of sulphite cooking. Svensk Kemisk Tidskrift 38, no. 7:177-192 (1926); Papierfabr. 24, no. 30:449-450; no. 32:483-488 (July 25, Aug. 8, 1926); C. A. 20:3807.

Hägglund, E. Digestion of spruce wood with sodium bisulphite. Papierfabr. 24, no. 50:775-780 (Dec. 12, 1926).

Hägglund, E., and Johnson, T. Chemical properties of spring and fall woods and their relative value as raw materials for sulphite pulp. Pappers-och Travarutidsk, no. 20, 1926; Wochbl, Papierfabr. 57:1399.

Hibbert, H. Sulphite pulp and its uses. Dyer and Calico Printer 56:29 (1926).

Hiller, O. Carbon dioxide formation in sulphite cooking. Zellstoff u. Papier 6, no. 2:74 (Feb., 1926); T. S. 83:100; C. A. 20:2748.

Kirmreuther, H., Schlumberger, E., and Nippe, W. Fluorescence experiments with commercial sulphite pulp. Papierfabr. 24, no. 7:106-107 (Feb. 14, 1926); T. S. 83:100; C. A. 20:2746.

Klein, Arthur St. Steam consumption in the sulphite process. Papierfabr. 24, no. 23A:65-66 (June 5, 1926).

Larrabee, B. T. Problems in the manufacture of sulphite pulp. Paper Mill 49, no. 23:18, 20, 58 (June 5, 1926); T. S. 83:143; C. A. 20:3082.

Leupold, C. W. The fluorescence of sulphite pulps. Papierfabr. 24, no. 36:397-398 (June 27, 1926); C. A. 20:3808.

Manufacture of sulphite pulp for rayon. Mon. Papeterie Belge 6: 335-336 (May, 1926); Paper Trade J. 83, no. 26-43 (Dec. 23, 1926).

Miller, R. N. The relation between cooking conditions and

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yield and quality of sulphite wood pulp. Pulp Paper Mag., Intern. no., 117-122 (Feb., 1926); Making Paper 8, no. 12:430-434; 9, no. 1:2-5 (June, July, 1926); T. S. 83:100; Tech. Assoc. Papers 9:114-117 (1926).

Miller, R. N., and Swanson, W. H. Chemistry of the sulphite process. VIII. Studies on the acid hydrolysis of wood. Tech. Assoc. Papers 9:118-122 (1926).

Miller, R. N., Swanson, W. H., and Soderquist, R. Chemistry of the sulphite process. IX. Influence of hydrogen ion in concentration. Paper Trade J. 82, no. 8:58-61 (Mar. 4, 1926); Tech. Assoc. Papers 9:123-126 (1926); T. S. 83,10; C. A. 20:1516.

Nielsen, A. E. Heat problems in the cooking of sulphite pulp. Papir-Journ. 14, no. 17:203-207; no. 18:216-220; no. 19:227-233 (Oct. 2-30, 1926).

Richter, E. The fiber length of sulphite pulps. Wochbl. Papierfabr. 57, no. 29:798-799 (July 17, 1926); C. A. 20:3810.

Rinderknecht, E. Steam consumption in sulphite process according to Ritter-Kellner. Wochbl. Papierfabr. 57, no. 46:1275-1277 (Nov. 13, 1926).

Round Table discussion of sulphite cooking. Pulp Paper Mag. 24, no. 28:811-814; no. 29:855-858; no. 30:881-884 (July 15-29, 1926);

Routala, O., and Sevon, J. The influence of a shortened preliminary cooking time on the nature of sulphite pulp. Zellstoff u. Papier 6, no. 6:257-259 (June, 1926); C. A. 20:3808.

Rue, J. D. Soluble sulphites and their bisulphites in the pulping of wood. A review of the literature. Tech. Assoc. Papers 9:137-139 (1926).

Schacht, W. Sodium sulphite and silicate pulp. Papierfabr. 24, no. 50:769 (Dec. 12, 1926).

Schwalbe, C. G., and Berndt, K. The penetration of spruce wood by calcium and magnesium bisulphite liquors. Papierfabr. 24, no. 17:250-253 (Apr. 25, 1926); C. A. 20:2747; T. S. 83:100.

Schwalbe, C. G., and Berndt, K. The cooking of pine wood by the sulphite process. Wochbl. Papierfabr. 57, Sondernum.: 27-37 (June 12, 1926); C. A. 20:3810.

Sieber, R. Ueber das Warmtechnische Verhalten des Sulfitzellstoff Kockprozesses. Reviewed in Pulp Paper Mag. 24:162.

Sulphite pulp for use in manufacture of rayon. Paper Trade J. 83, no. 26:43 (Dec. 23, 1926).

Summers, B. S., and Miller, R. N. Report of the sulphite pulp committee. Paper Trade J. 82, no. 8:195 (Feb. 25, 1926); Paper Mill 49, no. 10:14 (Mar. 6, 1926); Tech. Assoc. Papers 9:51 (1926).

Swanson, W. H. Temperature schedule in sulphite pulping. Paper Trade J. 83, no. 22:46-47 (Nov. 25, 1926); Paper Mill 49, no. 46:6, 8 (Nov. 13, 1926).

Swanson, W. H., and Monsson, W. H. Chemistry of the sulphite process. X. Easy bleaching pulp. Paper Trade J. 82, no. 8:62-64 (Mar. 4, 1926); Tech. Assoc. Papers 9:127-129 (1926); C. A. 20:1517.

Gas Manufacture

Dommer, O. Automatic determination of sulphur dioxide in burner gases. Chem.-Ztg. 56:382 (1926);

Glaser, F. The contamination of roaster gas with arsenic and the "Haff" sickness. Chem.-Ztg. 50:185 (1926); C. A. 20: 2748.

Hilpert,—. The "Haff" sickness. Papierfabr. 24, no. 11:162-163 (Mar. 14, 1926).

Lockemann, G. "Haff" sickness and the arsenic theory. Chem.-Ztg. 50:313 (1926); C. A. 20:2749.

Zopf, E. Electrical gas purification for the pulp industry. Wochbl. Papierfabr. 56:1540-1541 (Dec. 19, 1925); Papierfabr. 24, no. 3:38-43 (Jan. 17, 1926); C. A. 20:1520; T. S. 83:10.

Cooking Liquors

Berndt, K. Cooking diagram with magnesia containing liquors. Papierfabr. 24, no. 37:561-565; no. 38:584-587 (Sept. 12, 19, 1926).

Berndt, K. The use of magnesia cooking liquors containing large amounts of bases. Papierfabr. 24, no. 16:233-238 (Apr. 18, 1926); C. A. 20:2748; T. S. 83:100.

Boehlig, R. Recent developments in the construction of acid towers. Papierfabr. 24, no. 1:14-16 (Jan. 4, 1926); T. S. 83:10.

Causes of lime precipitation in blow pits. TAPPI Special Reports 1:17-23 (1926).

Hägglund, E. Sulphite process. VI. Changes in the composition of sulphite liquors during cooking. Svensk Pappers-Tid. 28, no. 24:659-660 (Dec. 31, 1926).

Hausen, J. Alkalies as a basis of sulphite liquors. Papierfabr. 24, no. 45:691-695; no. 46:709-713; no. 47:722-728 (Nov. 7-21, 1926).

Hausen, J. Sulphite liquors for the digestion of resin-rich woods. Wochbl. Papierfabr. 57, no. 51:1421-1425 (Dec. 18, 1926).

Krull, H., and Kuhn, A. D. J. Herstellung der Sulfitlauge. 2nd ed. of Hans Remmler's book. Berlin, Hoffman, 1925. 129 p. Review in Pulp Paper Mag. Canada 24:492; World's Paper Trade Rev. 85:312.

Sondak, W. L. Gas recovery from cooking liquors. Zellstoff u. Papier 6, no. 1:33-35 (Jan., 1926)).

Whitman, W. G., and Davis, G. H. Hydration of lime. Ind. Eng. Chem. 18, no. 2:118-120 (Feb., 1926); T. S. 83:10.

Analytical Methods

Birchard, W. H. A comparison of methods used for testing sulphite cooking acid. Paper Ind. 8, no. 5:793-796 (Aug., 1926); T. S. 83:224; C. A. 20:3565; Zellstoff u. Papier 6, no. 11:476-477 (Nov., 1926).

Chloramine as a substitute for iodine in the sulphite industry. Rivista tecn. sc. econ. 39:126-127 (1925); Chimie et industrie 15:783 (1926); C. A. 20:3083.

Phelps, M. W. Standard sulphite mill solutions. Paper Ind. 8, no. 4:623-624 (July, 1926); T. S. 83:224.

Richter, E. The fiber length of sulphite pulps. Wochbl. Papierfabr. 57:798-799 (July 17, 1926).

Reddening of Pulp

Reddening of sulphite pulp. Mon. Papeterie Belge 6:97, 99 (1926); C. A. 20:1322.

Strachan, J. The reddening of sulphite pulp. Pulp Paper Mag. Canada 24, no. 14:397 (Apr. 8, 1926).

Sulphite Waste Liquors

Allen, A. W. Economical use of (waste) sulphite liquor. Chem. Met. Eng. 32:928-931 (1925); C. A. 20:3807; T. S. 83, 54; Paper Trade J. 3:48-50 (Jan. 21, 1926).

Bruckhaus, W. Waste sulphite liquors as a tanning extract in the leather and textile industries. Wochbl. Papierfabr. 57: 310-312 (1926); T. S. 83:101; C. A. 20:2762.

Genberg, G. P. Waste sulphite liquor. Paper Trade J. 83, no. 15:58-59 (Oct. 7, 1926).

Hilbert, S. Recent developments in the utilization of waste sulphite liquors. Papierfabr. 24, no. 10:145-148 (Mar. 7, 1926); C. A. 20:2747; T. S. 83:101.

Krohn, V. The possibility of utilizing Finnish sulphite liquor by means of yeast organism. Ann. Acad Sci. Fennicae 23A, no. 8:3-147 (1926); C. A. 20:3808.

Meunier, L., and Jamet, A. Fluorescence of sulphite cellulose extract and its applications. Le Cuir Tech. 15:166 (1926); Halle aux Cuirs, April, 1926: 103; T. S. 83:143.

Muller, A., and Muller, M. The biological purification of unfermented and fermented sulphite waste liquors. Arch. Reichsgesund. 57:573-579 (1926); C. A. 20:3526.

Schwalbe, C. G. Waste sulphite liquor carbonization by means of mordant salt solutions. Zellstoff u. Papier 6, no. 3:113 (Mar., 1926); C. A. 20:2747; T. S. 83:101.

Trade

Anstrin, H. Metamorphosis of the Swedish wood industry.

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Svensk Pappers-Tid. 28, no. 3:55-57; no. 4:77-79 (Feb. 15, 28, 1926).

Baker, H. P. The pulp and paper industry in New England. Paper Trade J. 83, no. 20:55-58, 60 (Nov. 11, 1926).

British paper trade in 1925. Paper Maker 71, no. 1:13-15, 17, 19, 21 (Jan., 1926); World's Paper Trade Rev. 85, no. 1:1-2, 50, 52 (Jan. 1, 1926).

British paper industry in 1926. World's Paper Trade Rev. 86, no. 27:2065-2066, 2068, 2070 (Dec. 31, 1926).

British paper trade in 1926. Paper Maker, Annual no., 1926: 31-35.

Brock, G. W. Ontario paper industry experiences fair year. Paper Trade J. 82, no. 8:98-100 (Feb. 25, 1926).

Brot, M. Some present day problems of the French paper industry. Papier 29:505-516 (May, 1926); T. S. 83:213.

China clay in 1925. World's Paper Trade Rev. 85, no. 1:4 (Jan. 1, 1926).

Cornell, J. Economic background of the paper industry. Paper Mill 49, no. 12:2, 6, 8 (Mar. 20, 1926).

Craig, R. D. Present state of Canada's pulp wood resources. Paper Mill 49, no. 7:14, 16, 38 (Feb. 13, 1926).

Fielder, F. A. Few observations on the year 1925. Pulp Paper Mag. 24, no. 6:151-152 (Feb. 11, 1926).

Foster, A. W. The paper making year. World's Paper Trade Rev. 85, no. 12:906, 908, 910 (Mar. 19, 1926).

French paper market in 1925. Paper Trade J. 82, no. 13:40, 42 (Apr. 1, 1926).

Groud, Ch. Development of the paper industry in Poland. Papeterie 47:946-947 (Oct. 25, 1925); Pulp Paper Mag. 24, no. 1: 5-6 (Jan. 7, 1926).

Growth of paper manufacture in Canada. Paper Trade J. 83, no. 11:36, 70 (Sept. 9, 1926); Paper Maker 72, no. 4:407-408 (Oct., 1926).

Kellogg, R. S. Record breaking year in newsprint paper. Paper Trade J. 82, no. 8:77-78 (Feb. 25, 1926); Pulp Paper Mag. 24, no. 5:140-141 (Feb. 4, 1926); Paper Mill 49, no. 6:10 (Feb. 6, 1926).

Kiaer, O. E. The wood pulp situation. Paper Mill 49, no. 8:12 (Feb. 20, 1926).

Laughton, H. J. Paper industry expands steadily in past year. Paper Trade J. 82, no. 8:73-76 (Feb. 25, 1926).

McNulty, Wm. J. Maratime pulp and paper projects. Pulp Paper Mag. 24, no. 12:545-546 (Mar. 25, 1926).

Meese, Norman S. Pulp and paper industry of Finland. Paper Mill 49, no. 4:26, 28 (Jan. 25, 1926).

Meese, Norman S. The pulp and paper industry of Austria. Paper Mill 49, no. 47:35-36 (Nov. 20, 1926).

Mirus,—. Conditions of remunerative production in the paper industry. World's Paper Trade Rev. 86, no. 2:122, 124, 126 (July 9, 1926).

Naylor, E. Hay. Constant volume of business in fine paper. Paper Trade J. 82, no. 8:79-81 (Feb. 25, 1926).

Norwegian paper industry: the position in 1925 and the future. Paper Maker 71, no. 2:171-172 (Feb., 1925).

Paper industry of India. Bull Imp. Inst. 23, no. 4: 1925); World's Paper Trade Rev. 85, no. 7:506 (Feb. 12, 1926).

Paper industry of Poland. World's Paper Trade Rev. 85, no. 2:140-142 (Jan. 8, 1926).

Paper manufacture and handling in Korea. Zellstoff u. Papier 6, no. 4:180-183 (Apr., 1926).

Paper trade in China. World's Paper Trade Rev. 85, no. 2:126 (Jan. 8, 1926).

Paper trade of China. World's Paper Trade Rev. 85, no. 2:122, 124 (Jan. 8, 1926).

Papermaking materials: Market movements during 1925. World's Paper Trade Rev. 85, no. 1:62, 64, 66, 68 (Jan. 1, 1926).

Papermaking materials: Market movements during 1926. World's Paper Trade Rev. 86, no. 27:2132, 2134, 2136, 2138 (Dec 31, 1926).

Paper manufacture in Kweihwa (China). World's Paper Trade Rev. 85, no. 6:446 (Feb. 5, 1926).

Peteer, C. Russian paper industry of today. Papierfabr. 24, no. 18:271-273 (May 2, 1926).

Reid, J. R. Year of progress for the Wisconsin paper mills. Paper Trade J. 82, no. 11:34, 36, 38, 40, 42 (Mar. 18, 1926).

Sibley, C. L. Big developments in Canada's newsprint industry. Paper Trade J. 82, no. 8:95-97 (Feb. 25, 1926).

Smith, C. H. Paper and the paper industry. Pulp Paper Mag. 24:737-741 (June 24, 1926); T. S. 83:213.

Solitander, A. Paper industry in Finland. Paper Maker 72, no. 5:525-526 (Nov., 1926).

Swanson, O. F. Wood pulp industry enjoys remarkable year. Paper Trade J. 82, no. 8:88-90 (Feb. 25, 1926.)

Swedish pulp and paper. World's Paper Trade Rev. 85, no. 11:854 (Mar. 12, 1926).

Upson, C. A. The outlook for 1926. Paper Mill 49, no. 8:20, 22 (Feb. 20, 1926).

Van der Laan, J. W. Growth of the British paper trade. Paper Mill 49, no. 13:48 (Mar. 27, 1926).

Van der Laan, J. W. Paper and paper products in Central America. Based on reports submitted by consular officers in the Department of state. Washington, Govt. Ptg. Off., 1926. 22 p. Trade Information bulletin, no. 414; U. S. Bureau of foreign and domestic commerce.

Whitney, G. Price stabilization in the container and paperboard industry. Paper Trade J. 82, no. 16:30, 32 (Apr. 22, 1926).

Whitney, G. Paperboard will establish new high record. Paper Trade J. 82, no. 8:83-86 (Feb. 25, 1926).

Willson, S. L. Modern merchandising of paper and its relation to production. Paper Mill 49, no. 23:24, 66 (June 5, 1926).

Washing

Hoyer, F. New method of concentrating, leaching and washing half stuff in the paper industry. Z. Ver. deut. Ing., 70:197-198 (1926); C. A. 20:2068.

Kuhn, A. D. J. The patented cellular (Zellenfilter) devices of R. Wolf, A.-G. Wochbl. Papierfabr. 57:806-807 (July 17, 1926); Zellstoff u. Papier 6:364 (Aug., 1926).

Linari, A. Washing cellulose in Holland vats. Giorn. chim. ind. applicata 7:134-137 (1924); C. A. 20:3236.

Morrison, H. A. Bleach washing on vacuum drum washer. Paper Mill 49, no. 9:190, 194 (Feb. 27, 1926); Paper Trade J. 82, no. 8:219, 221 (Feb. 25, 1926); Paper Ind. 7, no. 12:2017, 2019 (Mar., 1926); Pulp Paper Mag. 24, no. 9:252-253 (Mar. 4, 1926); Tech. Assoc. Papers 9:63-64 (1926); T. S. 83:68.

Washing sulphite pulp. TAPPI Special Reports I:35-38 (1926).

Waste

Bearce, G. D. Report of the Committee on waste. Paper Trade J. 82, no. 8:143-146 (Feb. 25, 1926); Tech. Assoc. Papers 9:7-10 (1926); C. A. 20:1522; T. S. 83:84.

Bearce, G. D. Progress of waste elimination in the paper industry. Ind. Management 71:112-114 (Feb., 1926).

Disposal of broken paper. TAPPI Special Reports I:91-92 (1926).

Heess, J. How may waste from paper machines be decreased. Zellstoff u. Papier 6, no. 6:252-253 (June, 1926).

How may the waste of the paper machine be avoided. Zellstoff u. Papier 6, no. 11:470-471 (Nov., 1926).

Jobs,—. Causes of paper machine waste and their removal. Zellstoff u. Papier 6, no. 8:343-345 (Aug. 1926).

Leisten, W. How can the waste from paper machines be decreased? Zellstoff u. Papier 6, no. 7:305-306 (July, 1926).

Peteer,—. How can the waste from paper machines be decreased? Zellstoff u. Papier 6, no. 8:343-345 (Aug., 1926).

The

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Daily Capacity 450 TONS

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Butchers Manila
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General Sales Office
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Platzer, W. How can the waste from paper machines be decreased? Zellstoff u. Papier 6, no. 7:301-303 (July, 1926).

Reidel, L. How can waste from paper machines be decreased? Zellstoff u. Papier 6, no. 7:303-305 (July, 1926).

Rösner, F. How can waste from paper machines be decreased? Zellstoff u. Papier 6, no. 8:345-346 (Aug., 1926).

Schrag, O. How can waste from paper machines be decreased? Zellstoff u. Papier 6, no. 6:246-252 (June, 1926).

Versock,—. How can waste from paper machines be decreased? Zellstoff u. Papier 6, no. 6:254 (June, 1926).

Waste Paper

Schumann, G. The defibering of old paper. Wochbl. Papierfabr. 57, no. 29:796-797 (July 17, 1926).

Wenzl, H. Regeneration of old printing paper. Wochbl. Papierfabr. 57, Sondernum: 65-70 (June 12, 1926); Boll staz. sper. ind. carta 5, no. 8:77-80 (Aug., 1926).

See also Deinking.

Water

Bentzen, T. Practical water testing for the papermaker. Paper Ind. 8, no. 3:431-434 (June, 1926); T. S. 83:213.

Derchsler,—. The chemical pretreatment of industrial water. Papierfabr. 24, no. 21:309-310 (May 23, 1926); C. A. 20:3812.

Klein, A. St. Calculation of the water consumption for a sulphite and wrapping paper mill. Wochbl. Papierfabr. 57, Sondernumer: 56 (1926); C. A. 20:3810.

Minor, J. E. Water for paper. Paper Trade J. 82, no. 15: 60-62 (Apr. 15, 1926); Tech. Assoc. Papers 9:80-82 (1926); T. S. 83:144; C. A. 20:2072.

Minor, J. E. Analysis of water for use in making of paper. Paper Trade J. 82, no. 15:62-65 (Apr. 15, 1926); Tech. Assoc. Papers 9:82-85 (1926); T. S. 83:120; C. A. 20:2072.

White Water

Allen, A. F. Report of test made. Paper Trade J. 82, no. 24:51 (June 17, 1926); Paper Ind. 8:462 (June, 1926); T. S. 83:203; C. A. 20:3081.

Andrews, C. K. White water reports—Newsprint. Paper Trade J. 82, no. 24:51 (June 17, 1926); Paper Ind. 8 no. 3:463-464 (June, 1926); Paper Mill 49, no. 24:18, 38 (June 12, 1926); T. S. 83:203; C. A. 20:3081.

Bearce, G. D. White water reclamation. Paper Trade J. 83, no. 2:64 (July 8, 1926); Paper Making 45, no. 9:360 (Sept., 1926).

Bearce, G. D. Sewer waste and white water elimination. Pulp Paper Mag. Canada 24, no. 16:457-459 (Apr. 22, 1926); T. S. 83:164.

Cunningham, Noel. Hardinge system of white water treatment. Paper Trade J. 82, no. 8:223, 225 (Feb. 25, 1926); Paper Mill 49, no. 9:110-112 (Feb. 27, 1926); Paper Ind. 7, no. 12:1993, 1995 (Mar., 1926); Tech. Assoc. Papers 9:65-66 (1926); C. A. 20:1520; T. S. 83:68.

Gilman, E. H., and **Milham, E. G.** White water, de-inked stock and book paper. Paper Trade J. 82, no. 24:49 (June 17, 1926); Paper Mill 49, no. 23:38 (June 5, 1926); Paper Ind. 8, no. 3:461-462 (June, 1926); T. S. 83, 203; C. A. 290:3081.

Gregertsen, B. Control of the amount of fiber in back water. Papir-Journalen 14, no. 3:41-42 (Feb. 20, 1926).

Gregor, W. D. White water, sulphite pulp and book paper. Paper Trade J. 82, no. 24:48-49 (June 17, 1926); Paper Mill 49, no. 23:36 (June 5, 1926); T. S. 83:204; C. A. 20:3081.

McBain, B. T. White water waste. Paper Ind. 8, no. 3:464 (June, 1926); Paper Mill 49, no. 24:16 (June 12, 1926).

Muller, G. P. Testing waste waters. Papierfabr. 24, no. 44:681-683 (Oct. 31, 1926).

Peteer,—. Waste water purification in the paper industry. Wochbl. Papierfabr. 57, no. 15:416-418 (Apr. 10, 1926).

Server, H. W. Report on white water waste. Paper Mill 49, no. 23:34, 44 (June 5, 1926); Paper Ind. 8, no. 3, 459-460 (June, 1926); C. A. 20:3081.

Small, J. D., and **Larrabee, B. T.** White water, soda pulp and book paper. Paper Mill 49, no. 25:10, 40 (June 19, 1926); Paper Trade J. 82, no. 24:47-48 (June 17, 1926); Paper Ind. 8, no. 3:462-463 (June, 1926); C. A. 20:3081.

Smith, S. W. Machine waste water. Paper Ind. 8, no. 3:467 (June, 1926).

Wentz, S. C. White water (white book and envelope papers). Paper Trade J. 82, no. 24:50 (June 17, 1926); Paper Mill 49, no. 24:36, 38 (June 12, 1926); Paper Ind. 8, no. 3:461-462 (June 1926); T. S. 83:204; C. A. 20:3081.

Wires

Bouyer, V. Putting on a paper machine wire. Papier 28: 1337-1342 (Dec., 1925); T. S. 83:164.

Bouyer, V. Wearing out of paper machine wires through grooving of the suction box covers. Papier 29:1091-1096 (Oct., 1926).

Machine wires. World's Paper Trade Rev. 86, no. 23:1754, 1756 (Dec. 3, 1926).

Messmer, E. Effect of the arrangement of the suction boxes on the life Fourdrinier wires. Paper Maker, Intern. No., 1925: 47-49.

Miscellaneous

Causes and prevention of strings and slugs. TAPPI Special Reports 1:82-84 (1926).

Caverhill, P. Z. Forest fire prevention methods. Pulp Paper Mag. Canada 24, no. 15:440-441 (Apr. 15, 1926).

Dennett, P. Continuous production of uniform quality paper. Paper Mill 49, no. 18:6, 44 (May 1, 1926).

Development of production technique in the paper industry. Papir-Journalen 14, no. 8:100 (May 15, 1926).

Edwardes, V. P. Conservation and efficiency in paper making. Paper Trade J. 83, no. 18:33-36 (Oct. 28, 1926).

Keenan, T. J. Chemical developments in the paper industry. Paper Making 45, no. 10:392-393 (Oct. 1926); World's Paper Trade Rev. 86, no. 14:1060, 1062 (Oct. 1, 1926).

Lhomme and Argy. Control instruments in the paper industry. Mon. Papeteri Belge 6:411-421 (June, 1926).

Matagrin, Am. Use of perfumes in the paper industry. Papeterie 48:722, 725, 769-776, 821-822, 917-921 (Aug. 1, 25, Sept. 10, Oct. 10, 1926).

Paper technology, questions at the city and guilds examinations. World's Paper Trade Rev. 85, no. 24:1812, 1814 (June 11, 1926).

Payne, H. J. Cutting handling costs with electric industrial trucks. Paper Ind. 8, no. 4:646-648, 651 (July, 1926); Paper Mill 49, no. 25:12, 14, 42 (June 19, 1926); T. S. 83:213.

Ramar pulping process. Paper Trade J. 83, no. 18:98-100 (Oct. 28, 1926).

Rock asphalt. Its use in paper mills. World's Paper Trade Rev. 86, no. 6:442, 444 (Aug. 6, 1926).

Tacussel, Paul. "Fibramite"—a material with unlimited possibilities. Papier 29:1201-1204 (Nov., 1926).

Zon, R. Marathon to make swamp drainage experiment. Paper Trade J. 83, no. 19:37-41 (Nov. 4, 1926).

WEST JERSEY PAPER MFG. CO. EXPANDS

Extensive improvements are being made in the plant of the West Jersey Paper Manufacturing Company, of Camden, N. J., under the supervision of Edward K. Shelmerdine, president. The beater room is to be re-arranged to increase production and allow them to add several new lines to the company's present quality of rope specialities. In connection with these improvements, four new type Dilts beaters equipped with double disc siphon washers are to be installed in pairs and driven by subsequent motors equipped with Tex-rope drives. These improvements will make this mill one of the most modern operating on special rope papers.

MILTON E. MARCUSE
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BEDFORD PULP & PAPER CO.
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Paper and Pulp Mills of Bedford Pulp & Paper Co., Inc., at Big Island, Va.

Manufacturers of

BUTCHER'S FIBRE

Pine-Wood Board For Corrugating

Special Papers for Fibre Containers

General Offices: RICHMOND, VA.

Paper and Pulp Mills at Big Island and Coleman Falls, Va.

NATIONAL PAPER MERCHANTS MEET

National Paper Trade Association of the U. S. A. Holds Twenty-Fourth Annual Convention at Waldorf-Astoria Hotel, New York

J. C. Mallalieu of Geo. W. Millar & Co., New York Is Chosen President and A. H. Chamberlain Is Appointed Secretary of the Fine Paper Division and N. A. Schoenbucher, Secretary of the Wrapping Paper Division of the Association—Mortimer W. Byers Who Has Been Acting Secretary of the Association Engaged as Legal Counsel and General Advisor—Tribute to Mr. Ridgway

The annual meeting of the Wrapping Paper Division of the National Paper Trade Association convened on Tuesday, February 22, 1927, at two-thirty o'clock, at the Waldorf-Astoria, New York City, Mr. J. C. Mallalieu, Vice President, presiding.

CHAIRMAN MALLALIEU: It gives me great pleasure to greet you gentleman this afternoon. I am glad some of you got here only half an hour late. I think we will have more in a few minutes.

I think it is very fitting at this time to call your attention to the fact that the National Paper Trade Association was organized twenty-three years ago. At that time, a young man came into our employ as Secretary. He grew up with this Association and had been serving faithfully for twenty-three years. On December 28, he passed away. I will ask you gentlemen if you will stand for a few minutes in meditation.

Vice President's Report

The first order of business is the report of the vice President.

Almost continuously since the Fall Meeting in Chicago, the officers of the Association have been operating under a heavy handicap, caused by the protracted illness of Mr. Ridgway, which resulted in his death on December 28 last.

During my administration I have looked to him for his support, which was always given cheerfully and generously. Probably some of you who have not been officers, or thrown in close contact with him, do not realize what his passing away means to this Association; he was Secretary since its formation, had grown up with the Association, and his counsel and guidance had been invaluable to us all; consequently, his death has rendered it necessary for your Vice President to take a very active part in the running of the New York office, a contribution he has willingly made to the common cause.

J. C. MALLALIEU, PRESIDENT

I realize that you who have in the past used the Chicago office to a great extent, have been more or less disappointed in our not securing an Assistant Secretary, to be located at that city, and the above are the reasons, as the selecting of one was placed in the hands of Mr. Ridgway, but he was taken ill before this selection could be made.

About six years ago, when Frank W. Power was Vice President, he inaugurated the Conference Dinners with the Manufacturers, and since that time, these dinners have become a part of our semi-annual and annual conventions, which I trust will be continued for years to come. I believe they have led to a better understanding between the merchant and the manufacturer, which is bound to lead to closer co-operation, and I trust some day, that we will see a committee appointed, by both branches of the industry, that will help to solve our common problems and to adjust differences that may arise, as we all have come to see that neither branch of the industry can long succeed at the cost of sacrifice to the other.

I take this occasion to thank the Chairman, and each member of our committees, for time and thought that they have given to the Association work during the past year.

You are all conversant with what Mr. Corning has accomplished, as Chairman of the Tissue Committee; how he has worked for standardizing sizes and counts, and while his work seemed hopeless in the beginning, he has never given up hope, and is still working earnestly, accomplishing a little each day, and we in our market, have begun to see an improvement in conditions, and he will later report what has been done since October.

A year ago I formed and appointed two committees, the Gummed Tape, with Louis J.

Marshall, Chairman; and the Twine Committee, with Charles A. Shaw as Chairman.

These two items, most of us carried more or less as an accommodation for our customers, figuring them as a liability, rather than as an asset. I am glad to say that today, Gummed Tape is becoming a paper that can be counted as merchandise, and speaking for the house with which I am connected, and from what some others have told me, we are becoming very enthusiastic about the article.

Just a word about the other "liability," twine. I believe when you have received the report of Mr. Shaw, you are going to realize how deeply interested he and his committee are in their work, and will be surprised at what they have accomplished in such a short time. Within the next year, I predict that most of us will be carrying a larger stock of twines and will begin to appreciate what the committee has done in the cause of education as to this item. Twine should be regarded as a necessary item to us. All users of wrapping paper use gummed tape or twine, or both of these articles, and I trust when we have our next annual meeting, we shall be able to state truthfully, that we are selling both gummed tape and twine, at a satisfactory net profit.

Now, I want ot say a few words about a very vital part of Association activities, namely, the work of the Survey Committee, or which Arthur W. Blackman is Chairman.

As Chairman of this Committee for the first year of its existence, I speak with knowledge in stating that we were fortunate to get Arthur W. Blackman to accept Chairmanship one year later.

The foundation stone of the work of this Committee is, "Net Profit Control," so ably prepared and written by N. A. Schoenbucher, about eighteen months ago. In the beginning it was accepted by but a few. In fact, I believe, beginning January 1, 1926, only three or four of our merchants realized its value to such an extent as to adopt it for use in their own business, but as their results became known, the interest in "Net Profit Control" increased to such an extent, that it was necessary to print a second edition.

After listening to the able addresses of Arthur W. Blackman, Frank E. Ford, Edgar A. Hall, Jr., Jules Wolbrette, Roger H. Wellington, and C. A. Spaulding, at the Chicago Meeting last Fall, others became interested, and beginning January 1, 1927, I believe it has been adopted by about two dozen of our members, and probably by others, of which I have not heard, and at the meeting this afternoon, you will hear from some of the new converts who have adopted same.

My reason for stating that we were fortunate in securing Arthur W. Blackman, as Chairman of this Committee, was, that I know some fourteen or fifteen years ago, he began to think and work out plans to conduct his business on this principle, and I believe he is the inspiration for this booklet, "Net Profit Control."

From statistics I have seen, I know that the majority of us have done a larger volume of business in 1926 than we did in 1925. If this is true, how many of us have been more successful in 1926 from a "net profit" standpoint? If you are one of those whose sales were larger and net profits less, isn't it because you have *not* made a proper survey of your own business? The "Survey Committee" has shown you the light—follow it.

To make it easy, simple, and possible for you to analyze your business, N. A. Schoenbucher has prepared and the National Paper Trade Association has had printed recently, a book for the uniform classification of accounts. Please don't put this in the drawer of your desk as something you will refer to later. Take it home with you and immediately call in your cashier or accountant and have him adopt it, and after the adoption study it each month with him, find out what it costs you to merchandise, and then, I believe, you will discontinue taking business at a loss; you will become a good competitor and a constructive element in the community.

Properly and consistently used, this book will be worth many dollars to every member of this Association.

It is true that you will have a little extra work for a short time, but later on you will find that your days will be easier and your nights more peaceful. Use your pencil as a shield to your business, not as a sword with which to stab your competitor.

Since the fall convention in Chicago, I received letters from friends stating that some members and some associations did not feel that they were receiving much, if anything, for what they paid in for dues. This is not a new complaint, nor is it peculiar to our industry or our organization. You will receive from this Association, in the measure that you give, not in money but in thought and effort; if you apply to your own business the lessons that you learn in doing your share of the Association work you will discover in yourself a better merchant, and a better citizen than you ever were before.

You, from the local associations, elect your representative to attend your meetings; they receive the full reports of our meeting and if they neglect to make this report to you at your meeting do not blame it on the "National Association."

I would like to see more field work done by our Secretary and done in a systematic way which could be accomplished very easily if the local associations would arrange their annual meetings, following the annual, and semi-annual meetings of the National, starting say two weeks later, the local meetings to be at least two days apart, the secretary to attend and address these meetings, and then the local associations would be fully conversant with what the National Paper Trade Association has undertaken to promote the interest of your calling and the welfare of your industry. (Applause.)

The next will be the Report of our Acting Secretary. Gentlemen, this is Mortimer W. Byers, who stepped in at the death of Mr. Ridgeway to help us out in association work. Mr. Byers was long a friend of Mr. Ridgway's, having gone through college with him, graduated from Columbia, opened his offices in the same suite, and being associated with him in a friendly way next door since that time. (Applause.)

Report of Acting Secretary

ACTING SECRETARY: Mr. President and Gentlemen: I understand that but few words are expected from your Acting Secretary at this time. The recommendations made by your Executive Committee to the Board of Directors of the National Paper Trade Association were reported in detail, acted upon by the Board of Directors and will in turn be reported to the general meeting tomorrow afternoon. As you know, there was a conference dinner last evening attended by several representatives from the mills as well as by the Committee of your own division, and in order that you may know in brief form what was said at that dinner, I am going to submit the following brief report under the head of the various topics which may be of interest to you.

First, as to the kraft situation, the manufacturers reported that to be generally satisfactory and the most significant statement made was that in the South, where the production of kraft paper has recently assumed considerable proportions, local industries are absorbing substantially the entire product of the southern mills. No apparent reason exists for anticipating price recessions on these products.

The bag manufacturers, through their representative, report substantial progress in their program of simplification and standardization. This will inure to the benefit of the merchant and gradually the marketing of these products seems to be settling down to a stable basis.

With regard to sulphate and sulphite pulp and ground wood, there is not now, nor is there likely to be in the year 1927 a condition of overproduction. Market stability is not likely to be

disturbed during the current year. The sulphite bond situation is not satisfactory either from the standpoint of the manufacturers or the merchants. Both classes are in need of education in their costs of production and distribution.

The joint buying by department stores and chain store enterprises is believed to present a problem of gradually diminishing importance. The inability of such purchasers to make definite commitments and their preference for operating on the basis of what amounts to an option to purchase, without incurring contractual liability, carries with it its own probability of extinction. Merchants who allow themselves to be beguiled into such arrangements soon learn that the element of profit therein contained is largely theoretical.

The 1927 volume of business as far as it can be presently observed by the merchants seems destined to equal if not to slightly exceed that of 1926. Fundamental conditions throughout the country are sound, although the textile and shoe interests in New England and general commercial conditions in the Southern territory and the agrciultural conditions in the Middle and Northwest are believed to be disturbing factors. Those conditions are not capable of improvement at the hands of this body, but the fact that those conditions exist is worthy of your attention.

A. H. CHAMBERLAIN, SECRETARY FINE PAPER DIVISION

One speaker emphasized a subject which is worthy of your attention and very careful reflection, namely, the manifest tendencies of those who make your laws to so govern their activities as to favor labor unions and agricultural enterprises at the expense of the business interests of the country. Those two branches of our population are well organized, they are capable of bringing to bear a great deal of pressure upon national and state legislators. The business interests are neither coherent nor articulate on this subject. It is one of increasing importance and hardly a month has passed in recent times in which you have not read in the daily papers of decisions holding that various efforts made by merchants and producers to conserve their own interests through joint action are illegal and believed to be detrimental to the interests of the country as a whole. This subject, gentlemen, is not capable of disposition in such a meeting as this. It was referred to at the dinner last evening, and that reference is repeated and somewhat expanded in the hope that you will think about it. (Applause.)

CHAIRMAN MALLALIEU: Gentlemen, Mr. Byers is not conversant with the paper business. He had one little thing there confused in his statement made regarding Southern Kraft. This gentleman said the production in 1922 was eighty thousand tons, in 1926, one hundred and eighty-three thousand tons. The consumption of Southern Kraft east of the Mississippi and south of the Potomac River had increased to that extent. It didn't take into consideration mills in Texas. And today he said the increased consumption in the Southern markets in that territory was increasing rapidly, and that the increased production would be more than taken care of in the next few years. Otherwise, there are very few mills in the process of being built to get on the market within that time. It seems to indicate that Southern Kraft is being used largely in the South, and there will be less of it coming into the Northern markets.

The next I will call on is Mr. A. J. Corning, Chairman of the Trade Customs Committee. At the same time he will make his report for the Tissue Committee.

Now, gentlemen, I want you to ask Mr. Corning and other Committee Chairmen any questions you may want to ask. I wish, however, that you would confine them entirely to the subject on which they are talking. I don't want to hurry you or hurry the Chairman of any Committee in making his report or the discussion. At the same time, we have a very important part of our program, as I stated in my report, of the Survey Committee. We have some interesting talkers here this afternoon, and I want to give them just as much time as I can, as I feel that is the most important part of our meeting this afternoon. Mr. A. J. Corning!

Trade Customs Report

A. J. CORNING: Mr. Chairman and Gentlemen ofthe Wrapping Paper Division: I shall take Mr. Mallalieu's hint and make my report very brief. It necessarily will be brief, as interesting talkers will follow. The subject of trade customs in wrapping papers is one that I believe is very familiar to all of you. You recollect what transpired last February at this meeting. Some of you will recollect what transpired at Chicago last October. The matter of trade customs was laid on the table at the Chicago meeting. Knowing as you do what a motion to lay on the table means, you can very well understand what became of trade customs. In closing my report for the trade customs committee, I will say that the committee is still an active committee and is ready to function on instructions from the Association.

Now, I will report on the Tissue Committee. There has been promulgated since our last February meeting a set of trade customs by the Tissue Paper Manufacturers Association which I will read, as it will not take up a great length of time.

SHEET TISSUE

1. Count: 480 sheets shall constitute a standard ream of tissue paper

2. Standard Sizes (Government Standardization)

No. 1 and No. 2 Sheet Tissue	20 x 30—480
(Sizes to be standardized on basis of 24x36—480—10 lb.)	24 x 36—480
Tissue for Shoes	(8½ x 15)

(Sizes to be standardized on basis of 24r36—480—10 lb.)	(11 x 20) (12 x 24) (13 x 36)
Napkins (Bulk Flat napkins—1000 to package)	
Plain Tissue (10 lb. basis	13 x 13
Full Crepe	13½ x 13½
Over Size	18 x 18
Semi Crepe	13 x 13

3. Special Sizes

Special sizes shall be sold by the pound or there shall be an addition of five per cent to the price.

4. Over-runs and Under-runs.

On orders for special sizes or colors ten per cent above or below the quantity ordered shall be considered a good delivery and accepted by the purchaser.

5. Small Orders

On orders for less than ten reams an extra charge shall be made.

6. Marking

All packages shall be plainly marked outside with the official Association label, stating exact size, count and contents.

7. Actual and Nominal Weight

Paper sold by the pound shall be billed at gross weight and a variation above or below of 5% from the basic weight shall be accepted as a good delivery.

8. Packing

Where wrapper and string do not exceed 5% it shall be accepted as a good delivery.

Where paper is ordered in frames or cases then frames and cases shall be extra and billed at cost.

9. Claims

No claims allowed after paper is cut or printed.

Note: Exception cases occasionally arise where the fault is clearly with the mill and where absolutely literal enforcement of Trade Custom No. 9 would work injustice and hardship to the merchants. It is therefore understood that mills will enforce the spirit of this Trade Custom, deciding exceptional cases on their merits and according to the rules of equity.

10. Shipping Date

All "Make and Hold" orders must specify an ultimate date for shipment, at which date goods are to be billed and the invoice taken to account by customer whether ordered shipped or not.

11. Counting and Folding

For folding sizes smaller than 18 inches in length an extra charge shall be made in addition to the base price of 24x36—480.

12. Cancellations or Change

After acceptance and acknowledgment of an order, the right is retained by the manufacturer to refuse to permit changes or cancellations, unless the buyer agrees to reimburse the seller for any actual expense or loss incurred in the preparation of the order.

Acceptance of orders is contingent upon uncontrollable causes of delay or prevention.

TOILET PAPER

1. Standard Sizes (Government Standardization)

Sheet Toilet 5 x 7 in packages of 500 and 1000, basis 24x36—480—10 lb.

Roll Toilet, 1,000 and 2,000 sheet rolls, basis 24x36—480—10 lb., in the following sizes, which alone shall bear the label:

4½x5
4½x4¾
4½x4½

On unbanded toilet paper the label shall be placed on the carton.

Size and count shall also be placed on all shipping containers of all the above grades.

2. Marking

All packages shall be plainly market outside, stating exact size, count and contents.

3. Shipping Date

All "Make and Hold" orders must specify an ultimate date for shipment, at which date goods are to be billed and the invoice taken to account by customers whether ordered shipped or not.

4. Cores

If paper is shipped in rolls, wound on wooden or iron cores, the paper shall be removed therefrom by purchaser and the cores returned to the manufacturer at the invoice price, freight charges prepaid.

Cores not weighing over 13 ounces to the foot shall not be returnable.

5. Finishing Toilet Paper

For finishing toilet paper in large sheets an extra charge per hundred-weight shall be made above the price for the same weight of paper in jumbo rolls.

6. Private Labels

There shall be an additional charge for stock put up under private labels when order is for less than 25 cases.

7. Fixtures

Three gunmetal cabinets shall be the maximum number of fixtures loaned with an order for one case of Interfold Toilet Tissue Paper.

Your Committee has read these trade customs at their meeting and have no criticism. There will be a meeting tomorrow morning at nine-thirty, a conference tissue meeting, between the manufacturers and the merchants' committee, which constitutes the joint committee that went into session last year wih the Departmen of Commerce, Bureau of Simplified Practices, out of which meeting came the standardization with which you are all familiar. That has been in effect now for nine months.

The Department of Commerce has asked for this meeting tomorrow, at which the general public purchasers of tissue paper will be invited for the purpose of revision of the standardization program if recommendations are made for revision. This is submitted to you, gentlemen, as the report of the tissue committee.

CHAIRMAN MALLALIEU: Mr. Corning made a dual report, the first of which is trade customs. What is your pleasure regarding his report on trade customs?

MR. HALL (Chicago, Ill.): I move that the report be accepted. . . . The motion was seconded, put to a vote and carried. . . .

CHAIRMAN MALLALIEU: What is your pleasure regarding Mr. Corning's report on tissue?

MR. ROSENTHAL (St. Louis, Mo.): I move that the report be approved.

. . . The motion was seconded, put to a vote and carried. . . .

CHAIRMAN MALLALIEU: The next report is by one of our infant committees on Gummed Tape by Louis J. Marshall.

Report on Gummed Tape

MR. MARSHALL: Mr. Chairman and Fellow Members: I am going to take Mr. Mallalieu's cue and make my report short. This Committee is still in its infancy. We started functioning last fall. We had a meeting in Chicago in October. We met with the manufacturers.

From all reports that we receive, it seems that this item today is turned into a profitable one, whereas formerly it was anything but profitable.

I hope that the members will do their part in helping our Committee put over the program that we are working with, and if you will just lend your assistance I know that we will all be satisfied and will be pleased to have in your family the item of gummed tape.

The report was adopted.

Report of Twine Committee

CHAIRMAN MALLALIEU: The next is the report of C. A. Shaw of the Twine Committee. (Applause.)

C. A. SHAW: I shall necessarily make my report short because I can't cover the whole ground. We have had unusual success with the manufacturers and have gone into a great many channels. My report would be too long if I should attempt to tell you what we have done, and what we think we have succeeded in doing.

The Twine Committee of the National Paper Trade Association have had several meetings since the convention in Chicago. We have had conferences with the Jute Manufacturers Association of America and the Cordage Institute. At these meetings we have attempted to show the manufacturers what the problems of the paper and twine merchants are and I believe that they understand now better than ever before the condition of cordage business with the paper merchants. It was very noticeable that the attitude of the manufacturers was to cooperate to the fullest extent wih the merchants, and that their problems are similar to ours. They desire to work with us to make their products profitable for the merchants to sell. The Jute Manufacturers are issuing their price lists periodically covering a period of two months, instead of issuing them whenever they might see fit. This practice tends to stabilize the stocks carried by the merchants in their warehouses.

Through conference with your Committee a program of standardization and simplification has been inaugurated with both the manufacturers of hard and soft fibres and the present schedule of the soft fibre manufacturers has reduced the number of items manufactured from 4,490 to 2,170, which will mean a great saving to the mills, as well as a great benefit to the merchant carrying the warehouse stock. The schedule of standardization of the hard fibre manufacturers has not yet been completed. After these schedules have proven themselves, it is the hope of your Committee that they will be presented to the Bureau of Standards at Washington for its approval and that all manufacturers who adopt this schedule will mark their goods United States standard, with the size or weight of yarn stenciled on each package.

There has been considerable trouble in some large markets, such as New York, Chicago, Philadelphia and Boston where some of the manufacturers have been selling small lots through brokers and also direct. In justice to themselves the several manufacturers think that they ought to charge a differential to the merchant for small orders from a single reel to a thousand pounds.

It has been interesting to note that the Twine Committee have awakened so much interest wit hthe manufacturers, that they have not appointed Committees to meet us from their Association, but have had us meet with their full membership and this membership is made up of the owners of the different mills.

I believe that through the friendly relations which the Twine Committee is promoting with the manufacturers a great many of our troubles in the past will yield to better understanding and mutual forebearance in the future, and I will say that as it is understood that this committee will pass out of existence at this time, that I am going to ask the privilege of standing for at least a month or two to complete some very important work that they are now doing. (Applause.)

MR. BYRNE: In view of the splendid work which tnis committee has done and the wonderful progress which it has made, I move that it be made a permanent committee.

. . . The motion was seconded. . . .

CHAIRMAN MALLALIEU: Gentlemen, you have heard the motion made by Mr. Byrne.

MR. BYRNE: I would like to change that to read "one year."

CHAIRMAN MALLALIEU: I think the way Mr. Byrne has started in, he would like to make a life job of it, and he is certainly entitled to it if he likes it.

. . . The question was put to a vote and carried. . . .

CHAIRMAN MALLALIEU: This Committee has certainly worked hard and worked fast and they are to be commended. I think that we are going to see twine really something that we can merchandise in the next year.

Now, we are down very quickly, I am thankful to say, to the real part of our program, a part that has been given so much thought by Mr. Blackman and his committee, and I think that it is the most educational thing that has been done for the wrapping paper merchants for years. We have all seen Houdini locked in a box and tied with a rope, immersed in water and he was standing on the opposite side of the stage in forty-two seconds. Some of our members have been tied to the chair, their feet under the desk, immersed in red ink one, two, and three years. They, however, have been educated by some of these committees and they tell me today they are standing on the bank looking over the waters of blue. I take pleasure in introducing to you Mr. Arthur W. Blackman, Chairman of the Survey Committee. (Applause)

Report on Wrapping Paper Survey

MR. BLACKMAN: Your Survey Committee have felt that the success of the individual business is so closely tied up with and dependent upon the foundation of those principles incorporated in the net profit control plan, that it was our duty before expanding to any great degree in further flights, to be sure that that particular policy was thoroughly sold to the members at large. It has so many phases which might be developed along profitable lines to us all, that it is rather difficult to choose from them which one should be carried to perfection.

We have felt particularly at this time that the greatest obstacle to be overcome in the complete sale of this thought was the sort of intangible opposition, mental, of course, to the plan, owing to the fear of its effect upon the selling organization. It has been one of the most difficult subjects to treat and carry it across and do it well. You know, you can get a subject presented to you firsthand and it carries double the force that it does if it comes to you secondhand, and so your committee have felt that they would bring to you today their report firsthand.

Imagine a man standing at the corner of Broadway and 42nd Street with a quart of five dollar gold pieces and offering them to the passing public at $4.75 apiece. He would certainly be passed by as a fool joker, probably be pinched as a counterfeiter, and end up by being examined as to his sanity. Yet, most of us here in this room, if we figured the real overhead as part of the cost on each sale would find that we were, in reality, selling many five's each day for even less than the fool on the corner; the joke, consequently, being one on us, not on the public.

To offset the natural prejudice against the word "foolish," let us call such actions childish. Children are supposed to acquire wisdom by observation, teaching, and experience.

Customs are changing. Everything is speeding up. We seem to be taking all the hills "on high" these days. Chain stores, syndicates, and buying combinations of all sorts are crowding the pet customers off our books, if not off the map. Do we really know where we are going, and the best way to get there? There seems to be more one-way streets than formerly. We must watch our step and rely more and more on the traffic officer, it would appear.

Speaking of combinations, we observe the brighter and more progressive paper merchants are showing increased interest in the benefits of association work. A growing number of these houses, North, East, South, and West, this last year made a survey of the inside conditions as suggested in the Association pamphlet "In the Red."

With hardly an exception, the facts thus brought to the surface have resulted in sending hurry-calls for another copy of the formerly discarded pamphlet "Net Profit Control" in search of the promised remedy.

Then, through this second step of teaching we learn that two plus two makes only four, not twenty-two as we had somehow hoped. We are terribly shocked to learn that four less four leaves

nothing, and after playing hopskotch with a group of figures of the might-have-been variety, we begin to see the light. When we arrive at the point where we consult some of our more venturesome Association members already "in the know" the light gets stronger. We wake up some dark morning about four o'clock and toss and think and think and toss, until finally we snap our teeth together and say, "We have been asleep at the switch. This net profit control is the logical, practical, commonsense solution of both the selling and the salesmen's compensation problems from all angles, for all time. We will adopt it whether our competitors do or not. They will come to it eventually, too, but we will beat them to it."

Then comes the third step of experience, and with a glow of satisfaction we check up our efforts and results with fellow operators of the plan. With us from now on it becomes a daily game of skill instead of chance. We start each day sure of our footing and operating with eyes wide open toward a certain fixed mark determined upon. We wonder why we allowed envy, spite, and malice to control our sales policy rather than let sanity, good sense, and sound judgment regulate it. We rub our eyes in amazement to see how the sunshine of prosperity, security, and contentment has trickled down through our entire establishment. We come to a realization that our erstwhile enemies are no longer such, but are friendly fellow travelers with whom it is a pleasure to cooperate.

Perhaps you consider this a line of dream talk. If so, slumber on. But, Net Profit Control was certainly a dream come true for more than thirty members of this association this last year, and the list is growing steadily.

Following the mode of presentation of this committee's report as rendered at the last meeting in Chicago, we will, to give it full force, submit it firsthand through concrete cases.

We will do this by talks from four merchants selected from a large group now operating under the Net Profit Control plan, and we have deliberately taken them from widely separated parts of the country. These men have brought with them important representatives from their selling organization who will also speak.

During this part of the program extended and interesting comments were made by Frank Lloyd, Glenn Gaines, and E. A. Hall, Jr. Walter Seinsheimer and Mr. Lazanbey commented on "Why Net Profit Control was Adopted." F. R. Lloyd of the Edward Dunlap Company, Ltd., Brisbane, Australia, made interesting remarks and the meeting was concluded with comments on "The New Issue of Distributing Accounts" by N. A. Schoenbucher.

MEETING OF THE FINE PAPER DIVISION

The Annual Meeting of the Fine Paper Division convened on Wednesday, February 23, 1927, at ten-fifteen o'clock, at the Waldory-Astoria Hotel, New York City, Mr. W. N. Gillett, Vice President, presiding.

Tribute to Mr. Ridgway

CHAIRMAN GILLETT: In the late afternoon of December 30, 1926, a special meeting of the Directors of this Association was held in New York City. These men had just returned from the cemetery where our dear old Bill Ridgway was laid to eternal rest. It was a very sad gathering and we were confronted with the problems brought about by the death of a man who for nearly a score of years had carried on his shoulders the burdens of this Association.

At that Directors' meeting a committee of five was appointed to draft a suitable resolution to be presented at our joint meeting this afternoon. In spite of that fact, I do not feel that we should convene this meeting without paying our respects to the memory of Mr. Ridgway. In addition to Mr. Ridgway, we have lost two of our very loyal and helpful members, Mr. Everett Addoms, of New York, and Mr. Morris White McAlpin of Chicago. Their loss is a very keen personal loss—all of them; their loss is a very serious loss to the Association and I will ask the gentlemen in respect to their memory to stand in silence for a moment.

. . . The members arose and stood in silence for a moment. . .

CHAIRMAN GILLETT: At that same special meeting of the Directors, a committee was also appointed to interview Mr. Mortimer Byers to see if Mr. Byers would act in the capacity of acting secretary in this emergency we were facing. Mr. Byers was a roomate at Columbia University of Bill Ridgway's. He is an attorney, is the Secretary of the National Retail Stationers Association; had offices with Ridgway, and was a very close personal friend of Bill Ridgway's. Mr. Byers accepted the responsibility not only because of his great love for Bill Ridgway, but of his desire to cooperate with us, and I want to express my deep appreciation for the officers and the committee that Mr. Byers has taken hold in the fine shape he has. He has done a fine job and I think we owe him a debt of thanks.

Mr. Byers will make the report of the Executive Committee of the Fine Paper Division.

Report of Acting Secretary

ACTING SECRETARY: Mr. Chairman and Gentlemen: The meeting of the Executive Committee was held on Monday morning, February 21, and the following proceedings were had:

Report of Survey Committee. The Chairman of this Committee, Colonel Smith, reported that this committee had been in session on Sunday afternoon, and as a result of this very full discussion offered the following interpretations of the thousand sheet plan, namely: That blotting paper be put on the two-package plan, tag board on the basis of one-half thousand sheets, and gummed paper on the 1000 sheet basis.

In discussing these recommendations your Executive Committee was advised of the experience encountered on the 1000 sheet plan in various markets in this country.

At the conclusion of this discussion a motion prevailed that the recommendation of the committee be called to the attention of the various local associations.

The foregoing discussion occupied nearly the entire session. There were no reports from the clearing house committee or the publicity committee.

At one p. m. the Executive Committee took a recess until four-thirty o'clock, at which time the meeting reconvened and received the report of the marketing committee. the presentation of which and the attendant discussion lasting until six-fifteen o'clock.

The recommendations of the marketing committee who are promoting a campaign to extend the use of paper, received the hearty endorsement of the Executive Committee.

Report of Vice President Gillett

CHAIR..AN GILLETT: It seems but a few years ago, gentlemen, when I used to come to these New York Meetings. My usual schedule would be to go to the theatre in the evening and somewhere else after the theatre, get back to the hotel anywhere from four to six in the morning and sleep until noon; then attend the meeting of the Fine Paper Division and the joint meeting of the two divisions.

I was usually very much embarrassed if the chairman made any reference to the younger men coming along, but now that I have been quite definitely relegated to the old men's class—in fact I would say that the job itself is conductive to making it that way—my viewpoint has changed entirely and I find that the constructive work of the Association is by no means confined and is by no means represented by the activities of Fine Paper Division general meeting or by the combined meeting of the two

divisions. In fact, that is a very minor part of the activities of this Association. I did not suspect a few years ago that there were so many men, hardworking, loyal men, devoting their time, afternoons, days, evenings, to the problems of this association. There have been men in this hotel who have devoted practically every day and most every evening since Sunday to the problems of our association, and I think I am in better position now to appreciate what has been done for us in the past by these men than I would have been before, naturally.

There is no question but what every industry needs an association. The more important and larger the industry, the more important and valuable the association is to it. It is a safeguard, it is our business insurance in my mind. The paper industry is a big industry. It needs a big, strong association and it has a big, strong association. This Association has done some very constructive things during the past twenty years for our members, for ourselves. We must not only continue that program, we must keep up with the times and do more constructive things if we are to justify our existence.

Now, there are in my opinion several very obvious constructive things we should do. The first thing, it seems to me, as a promise, is that we must have cooperation and that, of course is a very much used word. It is subject to a great many variations of definition, but in my mind without that cooperation, which is based upon confidence in each other, on tolerance, broadmindedness, unselfishness, we can never accomplish the plans of the constructive program that we have before us. In my opinion, the next fundamental of our Association is to know how to do business, know our costs of doing business. Preferably, those costs should be based in such a way that they are profitable so that we can prepare cost, so that we can standardize our costs, at least our cost methods, so we can establish a ratio, if you please, to which the individuals can prepare their own costs.

That is a constructive piece of work, and I feel without knowledge of our costs we can't expect to go very far and preferably along standardized lines. We have to do more, I believe, towards making the paper merchandising more efficient. I believe we should do everything we can to reduce the price of paper, to put it into the hands of the printer and the ultimate consumer at the lowest possible cost. I feel that there are a great many ways that we can make a study and improve the merchandising of paper along efficient lines. We have a committee appointed for that purpose. Our Board of Directors authorized the appointment of a committee shortly after our last February meeting, the function of which is to go into the subject of the merchandising of paper from the standpoint of efficiency.

One very important topic or phase of that work, is the question of packing, and as you probably know, a great deal of research work has been done on the subject of packing and a great deal more will be done. The manufacturers are investigating it, the paper merchants are testing it out, and we have a committee that is appointed definitely for that function.

Another very important thing which has been hinted at in the past few years but we never have reached the point of doing anything definite on the subject, is the question of expanding the markets for the paper business; developing new markets and expanding our present markets for the use of paper. We have on our program this morning a report on the Marketing Committee, a committee which I formed shortly after the last February meeting and which was authorized by the Board of Directors, and this committee has worked out what we believe to be a very sound, constructive program. That program was submitted to the Executive Administrative Committee and met with their approval and will be on our program this morning.

We must also have a closer contact with our local associations, through our field men, and so forth, and do constructive, individual work with our local associations.

These are only a few of the things we can do and which we will do. How far we go depends, I think, entirely upon the cooperation received and the encouragement we receive. We can go just as far as you want to go.

I want to take this opportunity of thanking the chairmen of the various committees and the committeemen for their very fine work during the past year. They have devoted their time wholeheartedly to it and have worked out some very constructive things, and I believe that if we will all work together that we will find that 1927 will be the brightest, the most progressive year we have ever had. (Applause)

Gentlemen, I want to introduce to you Mr. Arthur H. Chamberlain. Mr. Chamberlain is the new Secretary in charge of the Fine Paper Division of the National Paper Association, a man entirely fitted for the position he is about to hold, and I bespeak your hearty cooperation. (Applause)

One of the compensations to me personally, for whatever work I have done in the past year or so on the thousand sheet plan, has been the close contact that I have had with Colonel E. T. Miller, Secretary of the U. T. A. of America. He has been a man with whom I have had to come in close contact and it has been a great pleasure for me to do so. We have lunched together for a year at least once a week. Colonel Miller is the brother of our own Frank Miller of Detroit. He is a fraternity brother of mine, incidentally, and I would characterize him in the words of Will Rogers which I read the other day when he was reporting an interview he had with Mussolini.

Will Rogers asked Mussolini if he had any message to send back by him to the Americans, and Mussolini said, "Yes, tell the Americans I am a regular guy," and I would characterize Colonel Miller as that surely. He has done a very constructive and wonderful piece of work for the U. T. A., and I am sure you would be interested in hearing about the U. T. A. program. (Applause.)

Col. Miller spoke at considerable length on the U. T. A. Program.

CHAIRMAN GILLETT: That talk certainly ought to give us a new viewpoint of association work. They are certainly doing a marvelous work. I would like to have you give a rising vote of thanks to Mr. Miller.

The next item of importance is the report of our Marketing Committee, of which Mr. Considine is the Chairman. I said a few minutes ago that the Board of Directors a year ago authorized the appointment of this Marketing Committee. The primary function of this Committee was to see if we could not develop a plan which would tend toward the expanding of the market for paper. This Committee has done a great deal of very thorough and constructive work. Their plan was presented at the meeting of the Marketing Committee, and subsequently to the Executive and Administrative Committee, which reconvened for that purpose. That committee thought it should be presented to the Fine Paper Division meeting. I will call upon Mr. Considine for his report. (Applause.)

Report of Marketing Committee

N. A. CONSIDINE: Mr. Chairman and Gentlemen of the Association: Your Marketing Committee has considered advertising and found there is nothing much there but what you are familiar with. They have also considered merchant advertising. That did not exist in very large quantities, although we believe that paper merchants might set a good example by using more direct mail advertising and thus increase the consumption of paper.

We have also considered the marketing program of the U. T. A. We have been very much interested in that campaign. We trust that this is only the first step of many they will take to furnish the printing industry with a corps of well trained, high-pressure salesmen who will know just as much about selling advertising, which means printing and paper, as the representatives of the publications, the outdoor advertisers and other forms of advertising.

Mr. Gillett has referred to the primary purpose of this committee. I wish to say that while the Chairman of this committee was groping around in the dark for months, writing to this mem-

ber of the committee and another, trying to find some way to pull down the strings that we had up in the air, one of the members of your Committee came forward with a plan, or rather an outline of a plan, that looked so good that I told him to go ahead and work out the details. He did. Nothing would please me better than to come before you today and say, "Here is my plan." I know I couldn't get away with it, because I would have to do considerable explaining. It is a plan that has had a great many ramifications, and the only thing I can do is to turn this meeting over to the man who worked over this wonderful plan. You will be interested, I am sure, in this plan. I wish now to introduce Jim Smith of the Chicago Paper Company, and ask him to tell you the story. (Applause.)

Mr. Smith told the story in a very interesting manner.

Endorse Program

MR. JOHNSTON: I really believe this is a very constructive matter that has been placed before the meeting, one of the most helpful and constructive that we have had in years, and in order to bring it definitely before the meeting I would like to offer this resolution:

"RESOLVED that the Fine Paper Division formally endorse the program of the Marketing Committee and recommend that the National Paper Trade Association appropriate two thousand dollars from its funds, provided the budget will permit, to reimburse the committee as may be necessary and to provide for further expenses incidental to the continuance of this work, preparatory to their report at the October Meeting."

. . . The motion to adopt the resolution was seconded, put to a vote and carried unanimously . . .

CHAIRMAN GILLETT: I just have a memorandum here I received the other day that recently there were 515 questionnaires sent out on the advertising for 1927, and that the replies received showed 53.5 per cent of the firms addressed, contemplated increasing their advertising appropriation for 1927, 43.5 per cent would maintain the same appropriation they have had, 2.2 per cent decreased their appropriation, and eight-tenths of one per cent were undecided, so it is evident that advertisers are going to continue to spend money for advertising. There is no use of my commenting on that program. In my judgment, it is a very constructive, sound, and carefully thought out program, and it will undoubtedly expand the markets for paper. We have been a little dilatory in that, I think.

I had the pleasure of meeting in the headquarters a visitor from Australia, Mr. Lloyd. Is he here now? Would you like to say a word to us, Mr. Lloyd? (Applause.)

Remarks by Mr. Lloyd of Australia

MR LLOYD: Mr. Chairman, I thank you very much for your welcome and for permitting me to come as a visitor to your meeting. Being interested in fine papers in Australia, I have listened to the remarks this morning with a great deal of interest. I was particularly interested in the address given to us by the Secretary of the Typothetae, because some of the points he brought out are things that I know have interested the printers in Australia.

I have been in the city of Brisbane for the past thirty-eight years in the paper trade and very close to the printing trade. When I first went up there, the printers simply carried on their business in a go-as-you-please fashion. A lot of the things which enter the printer's cost he simply forgot to think about, and the consequence was that in those days the printing trade in Brisbane was one of the worst possible trades you could find. The printer, whether a large man or a small man, never knew what a job cost him. All that sort of thing has been altered. The Association has of late years become very much more useful to its members, has adopted a very good cost system which is certainly not compulsory on its members, but which most of the members have adopted, and the result of that has been that the printing trade which was, as I said before, up until ten years ago, one of the worst has become a thoroughly prosperous trade, so much so that whereas most of the members used to come into the city by tram or train, they nearly all come in automobiles today.

Really, the same sort of principles which should govern the successful carrying on of a printing business should also govern the carrying on of a paper business. Unfortunately, we are not able to collaborate with those people who supply us with paper. You are in that favorable position here that the paper merchants can collaborate with those who supply you the goods. Where people are imporaters, they cannot get into such close touch and cooperation as you can here, and we are to that extent under a disadvantage because every printer can go and buy from other countries his supply quite as easily, if he has the capital, as the merchant himself can.

Yesterday, I attended the meeting of the Wrapping Paper Division; in that line, we are in a good deal happier position, because some of that goods is made in Australia and the merchants and manufacturers in that line are able to collaborate.

I know that very much the same problems affect us as paper merchants as affect you here. Fortunately, as I say, in some respects you are in a better position to deal with them, but still we all have to find the solution.

I won't take any more of your time, Mr. Chairman, except to say how very happy I am to be here and for the kindness which you have shown me as a stranger here. (Applause.)

CHAIRMAN GILLETT: We are delighted to have you here, Mr. Lloyd. Thank you for your remarks.

On the program, we had the report of the Postal Committee of which Mr. Ward is Chairman. I understand that instead of Mr. Ward, Mr. Lee, the attorney for that organization, will present the report this afternoon, giving us the last word on the subject, so we will not have that report now.

Mr. Smith, of the Publicity Committee, have you any report to make?

Report of Publicity Committee

ARTHUR SMITH: Mr. Chairman and Gentlemen: I told our President that I had no report to make, and after that I noticed the name on the program and I thaught I would get up to answer two questions.

Very naturally, you ask, what is the Publicity Committee? In the second place, why haven't they a report? The Publicity Committee was appointed for the purpose of reviewing the various trade publications, printing and paper publications, to see if any article appeared in there which was inaccurate or in any way reflected on the Paper Trade Association, and if so, it will be taken up and corrected. Such articles have occasionally appeared. Possibly they heard of the appointment of this Committee, because since that time nothing has appeared. I have had two or three communications from members of my Committee but of not very much consequence.

I want to say that the Committee is functioning very quietly, and we have really nothing to report. I feel very much like the Scotchman that brought the bottle of water, but unlike the Scotchman, I am glad that the others didn't bring bottles of water but brought somthing else. (Applause.)

CHAIRMAN GILLETT: The Chairman of the Efficiency Committee, Mr. Leslie, I understand is ill in the hospital. I know he has done a great deal of work on that Committee. Mr. McLaughlin, a member of that Committee, is with us, and I think he can at least report progress.

Report of Efficiency Committee

MR. MCLAUGHLIN: Progress is about all that we have to report, but I might say that this Committee is considering some matters which we feel will be of vast importance to the industry, and rather than to attempt to convey the idea to you before it is thoroughly prepared, we are going to postpone it until October, when we hope to make a report that will be material interest.

Report on Trade Relations

CHAIRMAN GILLETT: There is no report to make particularly to the Trade Relations Committee. That Committee, as you know, has a contact with the manufacturers. We had a conference luncheon with the manufacturers yesterday in this hotel, twenty-two I believe being present of the joint committees, and we had a very harmonious meeting. It was so harmonious I thought it probably was a failure, but we discussed of course primarily the thousand sheet plan, and I might say we have had no report from the Survey Committee. It will probably be very interesting to have a report. I think the situation can be summarized somewhat by example.

I remember hearing not long ago about some railroad where they were having financial difficulties, and their Board of Directors in meeting discussed the situation and ways out of their dilemma. After a good deal of discussion in which the president had not entered, he was asked for his opinion, and he said, "I will ask you a conundrum." They said, "What is that ?" He said, "How far can a dog go into the woods," They said, "We don't see the point." Well, they guessed around and they couldn't answer it, and finally he said, "A dog can only go halfway into the woods, and then he is on the way out." I feel that that is our situation.

Colonel Smith, have you a report to make for the Survey Committee? I will be very glad to hear from you. (Applause.)

Report of Survey Committee

COLONEL SMITH: Gentlemen, the best evidence of the report of the Survey Committee is the fact that the thousand sheet unit of counting weight is now in effect in a great many cities in the United States. Your Survey Committee has practically given all its time to that one feature, but I might just say this to your gentlemen—I know there are some of your here who are very much interested and have been waiting to see what happened to the other fellow before you would try. Colonel Miller has talked to you very splendidly on Association work, so I will not comment on that part of it particularly, but I just want to say this—in every section practically that the thousand sheet plan has been put into effect, it is working splendidly. You may naturally expect in anything you do to have a little friction here and a little friction there, but the point is, don't just because some fellow objects and you don't happen to hear the report on four or five hundred others, accept the thought of the minority.

I assure you that in our territory—I always like to speak of Louisville particularly, because, as I have said many times before, it is the most prominent town in America today and it leads.

I tried to get Mr. Schoenbucher to present this plan to our printers, but he was so busy that he couldn't come, and I happened to be the goat. I assure you, I went there with fear and trembling, not on the basis of the thing being wrong (because I know it was one hundred per cent right) but on how they would receive it.

Now, a lot of people tell us that the trousand sheet plan is all right but they say the printer won't stand for it. Gentlemen just get that out of your bean. You talk like the printer was some isolated kind of a man like Mr. Lloyd has in Australia known as a bushman, but they are not all bushmen in Australia, and Mr. Lloyd has proven that fact. That is the way you gentlemen act, as if your printer were a bushman with no religion, no conscience, or anything. I think he has a darned sight more sense than the paper men.

Then I began to think as to whether I had better deceive the printers in the usual way and keep up the reputation of the organization or whether I had better come out and tell the truth. I thought I would try the truth once as a new scheme; it might work. (Laughter.)

So then I just started right in and told them the whole story. I told them that what we were trying to do was to relieve ourselves of a loss on a service that we are bound to have and that we have been giving them for a great many years at a loss to ourselves.

I had gotten all these little reactions in the beginning, so I was forewarned. I knew they were laying for me on many things, and I thought I would anticipate them. I said, "I want to tell you right in the beginning that this plan has not been gotten up at all for your benefit. It is going to cost you more money, and it should cost you more money because you have been getting a service from us for years and we have been losing on it for your benefit, and now you shall pay for it. The thousand sheet plan was not put in there to deceive you. Some people have tried to smooth it over by talking about the thousand sheet plan and saying that the Typothetae wanted it, and they have done damage. Gentlemen, it just so happens that we were able to connect these two plans and accomplish the purpose we are driving at. We call it a thousand sheet, but you know it is two reams of paper, that is all it is. Heretofore, any quantity under two reams of paper, sold at the markup we have been making you, has been a dead loss. The Typothetatae wanted the thousand sheet unit of counting weight."

I went a little further into the decimal system. I said, "You want that," and I told them it was an easy way of figuring. "It so happened that we could serve the printer a little by connecting up what he wanted, the thousand sheet plan, with our markup. Our markup, however, is put there to prevent our loss."

Two printers then got up and made a darned sight better talk for the plan than I did. One printer from down in the country wrote us in pencil and asked us where we ran across the plan, that it was his plan, and he had been thinking about it for years and years and we had just resurrected it.

As you know, in the high-grade papers, the markup means a reduction over the old broken package from the five hundred sheets down.

Well, one fellow raised the devil because it lowered the price. Can you beat that?

Now, let me get back to some of you weak sisters. I am complimenting you when I call you weak sisters, let me tell you. (Applause.) Common decency won't let me tell you what I really think of you. But now let me tell you something—why should you put the burden on a few people and let them work like everything to find out what is right and then you hold them back? I do hate to compliment Noble Gillett, but I can't help doing it; I have got to do it. He has worked like the Dickens, and so have Mr. Miller and Mr. Addoms and Mr. McLaughlin and Mr. Seyler. All those gentlemen have never flinched from spending their money, going to any meeting in any part of the country, to put this thing over for you, and it is all at their own expense.

We all do it gladly, but we would like to have you just give us a little cheer occasionally, a little bit of cooperation. But for you to say that you can't do this and you can't do that, by golly, nine-tenths of you have never studied it, and you don't know any more abou it than a cat's hind foot. That is the truth of it. If you did know it, you just simply wouldn't turn it down.

I have just ask for the Survey Committee that you gentlemen who have considered this but haven't quite gotten backbone enough to remember that the printer has got just as much sense as you have, he is just as fair, he realizes your troubles, and he is perfectly willing to pay at least the cost of handling your goods. I don't believe any of you have a customer in your whole territory that if you go to him honestly like a man and tell him that, that he won't come out and root for you instead of being ready to condemn you.

Gentlemen, that is the report of the Committee, and I hope that you gentlement who are doubtful will brace up a bit and try to help yourselves by adopting that plan.

CHAIRMAN GILLETT: I appeared before the Executive Council of the Master Printers Federation, the only body of printers in Chicago who are organized to which all the locals are affiliated, and at that Executive Council meeting; they unanimously passed a

resolution which I have here endorsing the one thousand sheet plan in its entirety. Furthermore, that same Thursday I went before their monthly meeting in the evening at six-thirty. I presume there were 150 or 200 printers there. I gave them the facts on the thousand sheet plan as I know them, and the result was that the Master Printers Federation as a body entirely endorsed unanimously the thousand sheet plan and endorsed the Executive Council's action. They also have promised to support the movement and do whatever promotion work they can for it.

I don't feel as though I should close this meeting this morning without expressing my very sincere appreciation to our speakers today and also to the committees who have worked so conscientiously during the past year and to bespeak for them the continuance of your cooperation and support.

GENERAL MEETING OF THE ASSOCIATION

The Annual General Meeting of the National Paper Trade Association convened on Wednesday afternoon, February 23, 1927, at two-twenty o'clock, at the Waldorf-Astoria Hotel, New York City, Mr. Albert M. Miller presiding.

CHAIRMAN MILLER: If the meeting will come to order we will first listen to the report of our Treasurer, Mr. K. S. Warner.

. . . . Mr. Warner read the Treasurer's Report. . . . .

CHAIRMAN MILLER: I will entertain a motion to approve this report.

MR. ADDONIS: I move that this report be accepted.

. . . . The motion was seconded, put to vote, and carried. . . . .

CHAIRMAN MILLER: The next order of business is the report of the Acting Secretary, Mr. Byers. (Applause).

Report of Acting Secretary

ACTING SECRETARY: A history of the year now closing from the standpoint of the Secretary of your Association would be difficult of formulation in any comprehensive way because many of the most important achievements of the offices and committees have not been recorded in documentary form in the Secretary's office. This is necessarily true because the continuous functioning of the various committees has rendered it difficult to establish dividing lines between the various accomplishments.

The members of the Association are familiar in general with the progress that has been made and such special recommendations or suggestions as may seem to require attention at this time have been referred to in the reports of your Executive Committees and Board of Directors.

The membership of the Association on February 19th, 1927 is composed of fifteen local associations, comprising 390 individual members. On February 15th, 1926, the membership consisted of 16 locals, with an individual enrollment of 401. The decrease is due to the resignation of the Iowa Paper Merchants Association, received February 15th, 1927. It is gratifying to note that the Southwestern Paper Merchants Association, whose resignation was laid on the table at the Board of Directors' meeting in October, at the suggestion of Mr. C. E. Schoff, the President of that Association, has reconsidered the resignation and in a letter from Mr. Schoff, under date of October 30th, 1926, to Mr. Ridgway, he states that after giving the matter serious consideration, his Association had decided to continue its membership in the National Paper Trade Association. This Association has a membership of eighteen.

With regard to the functioning of your various committees during the period embraced by this report, it would be impossible to seek to classify the various efforts in the order of their importance, because they are all important and taken together represent those purposes which in the judgment of your experienced officers and directors are best calculated to promote the interest of the paper industry from the standpoint of the merchant.

It may be doubted, however, if any work is more important than that of the Survey Committee in both Divisions involving as it does an analysis of costs to the closest possible degree. Sight should not be lost of the fact that the enduring contribution which Trade Associations can make in their respective fields, is education; that is to say, the Association can not supply an education for its members but it can present to them facts and figures which will enable them to educate themselves. The extent to which they take advantage of the opportunities thus offered measures the success of the Association, not the extent to which the Association tries to think and act for its members.

You have been called upon to suffer a bereavement, the nature and extent of which is so clearly understood by you that reference thereto in this report is made only for the sake of record.

William C. Ridgway, who had been the Secretary of this Association from the time of its formation, and whose fidelity and high capacity in the office of Secretary have challenged the admiration of all who knew him, passed from this life on December the 28th, 1926. During the past ten years he had given practically all of his time to the work of this Association and had so greatly endeared himself in the personal sense to all who were brought in contact with him, that a consciousness of personal loss, deep and lasting, was experienced by every one to whom the sad news came at the close of the old year.

It will be no surprise to you that his office was so organized that during the interval which has elapsed since that time, it has been possible for a temporary incumbent to assist your President and Vice-Presidents to keep the machinery in the Association functioning. This would not have been possible except for the loyalty and very conspicuous capacity of Mr. Ridgeway's assistant, Miss Shepard, whose familiarity with the affairs of the Association, and whose devotion to Mr. Ridgway's memory is worthy of such tribute at least as is to be found in this mention in the records of the Association.

During the last year of his life, Mr. Ridgway devoted himself assiduously to the promotion of the 1000 sheet plan and to the activities of the various committees of the Association. This required his presence in the cities of Philadelphia, Baltimore, Chicago, Syracuse, Cleveland, Rochester, Holyoke and Detroit, at different times during the year, in addition to the discharge of his duties in the New York office.

The decision of the United States Supreme Court in the Pacific States Paper Trade Association case has clarified many of the problems involved in the correct administration of the affairs of this organization. Whether that process of clarification has rendered these problems more or less difficult of solution, time alone can tell.

Your Board of Directors at the meeting held on Monday of this week, considered several matters originating in the respective Executive Committees and otherwise, which may be tabulated, as follows:

First, a separate budget for each division of the Association. It is the recommendation of your Board that this subject be referred to the special committee on the change of administration and on the reorganization of the budget of this Association. If that recommendation of the Board has your approval you may so indicate by your vote at the conclusion of the report having to do with all of the matters presented to you by the Board.

The second recommendation was that of traveling expenses of both vice presidents in attending other than national association meetings, to be compensated to them. The Board also recommended that that suggestion be referred to the Committee hereinafter referred to.

Third, a recommendation originating in the Executive Committee of the Wrapping Paper Division was that the by-laws be amended so as to provide that twine dealers may become members of local associations, and thus affiliated with this organization. An appropriate proposed amendment to the by-laws has been prepared and in a few moments I will read that amendment in connection with other necessary amendments.

The next recommendation made to the Board and endorsed by it for your approval is that bulletins be published twice a month or oftener is necessary, reflecting matters of interest to the Wrapping Paper Division, and in that connection the Board recommends that such bulletins be edited by the vice president in charge of the Wrapping Paper Division.

The subject of a change in the administration of the Association was presented in the report, or the remarks rather of the president made at the meeting of the Board. A special committee was designated by him to prepare a report embodying his views. That report was presented to the Directors and approved by them. It is as follows:

"The Committee appointed by President Miller to recommend to the Board of Directors changes in the administrative structure of this Association submit the following:

"(1) That there shall be two secretaries, one who shall work under the jurisdiction of and report to the Vice President of the Fine Paper Division, and one who shall work under the jurisdiction of and report to the Vice President of the Wrapping Paper Division.

"(2) That each Vice President shall report to and be under the jurisdiction of the President of the Association.

"(3) That there shall be a legal counsel who shall be general advisor to the President and Board of Directors of the Association and who shall act as Secretary of any general meeting of the Association and the meetings of the Board of Directors.

"He shall be engaged at a stipulated annual retainer to perform all routine duties which come within the scope above indicated, and his advice shall guide the conduct of all Association activities.

"(4) That the necessary amendments to the by-laws of the Association shall be approved at once to enable us to proceed in accordance with this report.

"(5) We further recommend that all conflicting action pertaining to changes in the Chicago and New York offices be rescinded and annulled.

"(6) That in conformity with the foregoing, the Secretary acting under the Vice President in charge of the Fine Paper Division,, have headquarters in New York City, and the Secretary acting under the Vice President in charge of the Wrapping Paper Division have headquarters in Chicago.

"(7) That Mr. N. A. Schoenbucher be engaged for the Chicago office and Mr. Arthur Chamberlain for the New York office for one year from March 1, 1927, at the following salaries:

N. A. Schoenbucher .....$12,000 per annum
Arthur Chamberlain .....$10,000 per annum

"That Mr. Mortimer W. Byers be engaged as legal counsel and general advisor, as previously outlined, at a retainer of $3000 per annum starting March 1, 1927.

"(Signed) W. N. GILLETT, FRANK FLOYD, HARRY MATHEWSON, ALBERT M. MILLER, W. B. STEVENSON."

On the presentation of that report and on a motion having been made to adopt it, the following amendment was offered by Colonel Thomas Smith and seconded by Mr. Zellerbach:

"That an educational and Research Bureau for both Divisions be formed, and that it may or may not be presided over by the Secretary of the Wrapping or Secretary of the Fine Paper Division. Also it is recommended that for the first year Mr. Schoenbucher be put in charge of said Bureau."

On the vote being called on the amendment, it was approved and then the report as so amended was offered for adoption and was unanimously approved by the Board.

The amendments to the by-laws contemplated by that report were prepared by your Chairman, your President, with certain clerical assistance, and they are now offered to you as follows:

Amendments to By-Laws

Article III, Section 1: Amend this Section by inserting after the word "paper" in the first line the words "and or twine," so that the Section, as amended, will read as follows:

"Any organization of paper and oblique or twine merchants in the United States, composed of dealers or merchants, as defined in Section 2 of this Article, shall be eligible for membership."

Section 2 of Article III: After the word "etc." in the fourth line, that is, after the abbreviation "etc." in the fourth line, insert the words "or twine," so that the Section as amended will read:

"A dealer or merchant is defined as follows: A corporation, firm, or individual carrying a general stock of various grades of regular stock sizes and weights of paper (either printing or wrapping, or both) card boards, envelopes, etc., or twine, from which any quantity, large or small, can and will be sold; in fact, a general distributor for manufacturers."

Is it your pleasure gentlemen, to act on these proposed amendments as they are offered, or do you wish to have them all read first and then act on them?

CHAIRMAN MILLER: I think unless there is some objection, that we will read them all and act on them as a whole.

ACTING SECRETARY: Article V: Amend Section 2 by adding this sentence: "He shall have entire supervision over the officers and activities of both Divisions," so that the Section as amended would read:

"Section 2. The President shall preside at all meetings of the Association and of the Board of Directors; he shall be a member ex-officio of the Executive Committees, hereinafter provided for, and shall perform such other duties as are usual for such an officer. He shall call at least two meetings of the Board of Directors during the year. He shall have entire supervision over the officers and activities of both Divisions."

Section 3 and Section 4: Insert at the beginning of each Section the words "Subject to jurisdiction of the President," so that the Section as amended would read as follows:

"Section 3. Subject to the jurisdiction of the President, the Vice President in charge of the Wrapping Paper Division shall preside at all meetings of that Division and of its Executive Committee. He may call meetings of the Executive Committee of that Division at such time and place as he may designate.

Section 4. Subject to the jurisdiction of the President, the Vice President in charge of the Fine Paper Division shall preside at all meetings of that Division and of its Executive Committee and in the absence or temporary disability of the President, perform his duties. He may call meetings of the Executive Committee of that Division at such times and places as he may designate."

Article V, Section 6: Strike out the word "Secretary" in the second line and insert the words "President or either Vice President," so that the Section as amended would read:

"Section 6. The Treasurer shall receive all monies and disburses the same upon voucher approved by the President; he shall fully account at the annual meeting, or at any time, upon demand of the President. He shall be bonded at the expense of the Association."

Article V: Insert a new Section 7 to read as follows: "There shall be a legal counsel who shall be general adviser to the President and Board of Directors of the Association, and who shall act as Secretary of any general meeting of the Association and the meetings of the Board of Directors; he shall be engaged at a stipulated annual retainer to perform all routine duties comprehended within the scope above indicated, and his advice shall guide the conduct of all association activities."

All Section 7 becomes new Section 8. Most of the old Section is stricken out and a proposed new Section to be numbered Section 8 to read as follows:

"There shall be two secretaries, one for the Wrapping Paper Division and the other for the Fine Paper Division. Their duties shall be prescribed by the respective vice presidents, subject to the approval of the President, or by the respective Executive Committees, or by the Board of Directors."

Article VI, Section 6: Change to provide for two secretaries. The Section in its amended form would read as follows:

Section 6. The Board of Directors shall appoint two secretaries,

one for each Division, and fix the compensation for their services."

Those are all of the changes which are presented to you pursuant to the report of the special committee just read and necessitated by the adoption of that report.

In conclusion, and acting under the powers conferred by the appropriate section of the by-laws, namely Article I of Section 5, your Board of Directors proceeded to make nominations for the office of President, two Vice Presidents, and a Treasurer as follows:

The New Officers

President—J. C. Mallalieu.

Vice President for Fine Paper Division—W. N. Gillett.

Vice President for Wrapping Paper Division—H. W. Mathewson.

Treasurer—Mr. Charles Addones.

That, gentlemen, concludes the report of the activities of your Board of Directors so far as it is necessary now to present it.

CHAIRMAN MILLER: That was pretty good for a man on the job such a short time, wasn't it?

Now, gentlemen, the report of the Acting Secretary is before you for consideration. With the approval of the same, if it is your pleasure, we will include the ratification in changes made by the Board of Directors in our by-laws and the change in our set-up, as I will explain later in more detail in making my report, but if any of you want any more explanation of it before voting on it, I will be very glad to throw the matter open by having a motion made that the report and recommendation be approved.

MR. WARD: I make that motion.

. . . The motion was seconded. . . .

CHAIRMAN MILLER: Now the matter is up for discussion. Any questions regarding the recommendations of the Board of Directors, including the necessary changes in our by-laws? If not, are you ready for the question?

. . . The question was put to a vote and carried unanimously. . .

Report of Postal Committee

CHAIRMAN MILLER: We have one matter of business which comes to us from the program this morning. Mr. Ward, Chairman of the Postal Committee, is here and ready to make a report, and to introduce in connection with the same, Mr. Lee, and we have alloted them ten minutes on our program. Mr. Ward, will you proceed?

MR. WARD: Gentlemen, to refresh your memory, two years ago there was a Postal Committee appointed of which I was made Chairman, to work for a new Postal Bill which was then being taken up in Washington. After your Committee went into matters, we found that we might function very much better if we worked through the National Council of Business Managers, and in turn I, as your Chairman, was elected to the Board of Governors of that Association. And so they have been working for this new bill that you are going to hear about, for two years. I want to say, and possibly the last thing I will say on Postal matters, that I certainly appreciate the very wonderful way that you, as individuals, supported me and in turn the National Council with your contributions. Fully ten per cent of all the moneys raised came from the National Paper Trade Association, and I am quite sure that Mr. Lee will bear me out when I say that without that financial support, I don't believe the fight could have been made that has been made.

Now, it is a very nice thing to be able to make the kind of a report that I could make to you today in reference to the Postal Bill. It has been a long and interesting fight, and I think that you are going to be most satisfied with the result, but I have had such a small part in the work that in view of the fact that Mr. Lee who has fought that fight for us is in New York, it seemed to me that it would be far more satisfactory to you and certainly the due courtesy to him to ask him to spend about five or six minutes to give you a quick resume of exactly where we are and where we go from here. Mr. Lee. (Applause).

Report by Mr. Lee

Mr. Lee presented a supplemental report

CHAIRMAN MILLER: I am sure, Mr. Lee, I speak for the entire organization in our appreciation of your coming here and explaining this matter. I would have liked to see a few more pencils and papers come out to make some notes, because I really feel that we ought to get behind Mr. Lee and our Committee by communicating with our Congressmen and helping to support and pass this bill. It really means more business to all of us, either directly or indirectly. It should increase the parcel post business, should it not, Mr. Ward?

MR. WARD: Absolutely.

CHAIRMAN MILLER: That takes in the wrapping industry, doesn't it? I want to get that across.

MR. LEE: I might say to you that our questionnaire survey upon parcel post shows a frightful falling off in catalogs. The great majority have either cut out their large catalogs entirely and gone to smaller ones or have cut them out entirely. In very few instances do we find that they are still holding to the same size under the new rates.

CHAIRMAN MILLER: Every paper merchant is vitally interested in the production of catalogs, I am sure.

QUESTION: Does Mr. Lee recommend wiring or writing these gentlemen in Washington?

MR. LEE: I recommend wiring. I hate to ask you to do it. I know you have to give to so many things, and it is so easy to say, but frankly wires get more attention in Washington than letters do. I think that probably 98 per cent of the wires actually reach the members of the House and the Senate and probably 2 per cent of the letters. I know your letters would probably fall within the 2 per cent group because you are important men and the secretary would probably be impressed by the names and think that his job is in danger and send it in, but on the other hand, your wires will get in and they will get there quicker and give us just that much more in what is a very short session. Another thing about the wire is that you can send that this evening right downstairs without going home to dictate on your own stationery.

CHAIRMAN MILLER: The point is well taken.

Gentlemen, we have a very full program, and I am going to pass on very quickly. I am going to ask Mr. Considine, who is Chairman of our Import Committee, to make a statement of the import situation.

Report of Import Committee

N. A. CONSIDINE: Mr. Chairman and Members of the Association, it seems almost a shame to occupy valuable time discussing imports at this full session when from your Committee's observation the interest in imported papers has been gradually dying out among paper merchants during the past year due to the higher prices of paper abroad and the lower prices with American mills. News print paper of course continues to come in in growing tonnage. The imports of kraft wrapping paper for 1926 declined by 40 per cent in tonnage. Book paper imports declined only slightly in tonnage and increased slightly in value.

The peculiar situation that exists is revealed by a study of the imports for 1926, and that is that there are certain grades of paper protected by very high tariff duties, some of them four cents per pound and plus 15 per cent and over, and yet the imports of these highly protected papers increased during 1926. For example, writing and bond paper imports increased over 15 per cent in tonnage and one-third in value; surface-coated papers, one-third in tonnage and one-half in value. These imports are quite apparently specialties not sold through regular trade channels, and as I said before, the interest in imported papers of the standard qualities has been so slight during the past year, your Committee has considered whether or not it might be advisable to discontinue its organization.

There is still pending a final decision on the M. C. Sulphite and Wrapping Paper cases which were so widely discussed two years

ago. On these cases 338 pages of testimony have so far been taken, and we understand the final hearing will be held on March 24. It is hoped by both sides to make this the end of a very annoying and exasperating situation. I am tempted to say that the tariff law is more confusing than the income tax law. One thing about the income tax, if you get a high-priced accountant, he can get to the bottom of it. The tariff has been in operation for over four years now and yet the government hasn't finally decided what is standard news print paper. Last year they spent a lot of time and the tax payers' money debating the issue as to whether news print made out of the sulphate pulp instead of sulphite should not be classified as something else besides news print paper, because the treasury definition specified that it must contain not over 30 per cent of sulphite pulp and not less than 70 per cent of ground wood. I spent a whole day myself helping another importer fight a government attorney who wanted to asses a fine for improper marking of the country of origin on an importation of supercalendared book paper because it was not water-marked with the country of origin.

You may laugh at these things, but if you had to hire a lawyer and go into court for a couple of days to prove such proposals impractical without destroying the utility of the paper, it wouldn't seem so very funny. Within the past few months here in New York I understand the question was raised in a customs port by the government as to whether or not news print should not be water-marked with the country of origin to comply with the requirements of the law. We believe that because of high production costs in Europe, lower prices in the United States of America and the tariff wall there will be small imports of standard grades of paper excepting news print during the coming few years. We believe that it would be advisable, however, for American paper merchants to keep open their avenues of contact with those foreign sources of supply that have first given to us our sulphite bonds, kraft paper, Bible and India paper, glazed and many other grades of fancy and novelty papers that were once the foundations of splendid business for paper merchants but which today, behind a high tariff wall, are sold very largely direct by American producers to consumer without the merchant's agency.

After full consideration, your Committee believes that it might be well to continue your Import Committee so as to be prepared to assist your membership in any situations that may arise in the future similar to those that have existed in the past. (Applause).

CHAIRMAN MILLER: The Chair would like to entertain a motion approving the report of the Import Committee to carry with it the approval of the continuance of this Committee. Most of you probably didn't know we had such a committee, but you see how they have been at work.

MR. BROWN: I so move.

MR. CARPENTER: I move that the report be approved and the Committee continued.

. . . The motion was seconded, was put to a vote and carried. . .

CHAIRMAN MILLER: Next we are to be favored with an address on "The Business Outlook," by Henry A. E. Chandler, an Economist in the National Bank of Commerce, New York. Mr. Chandler, we are very happy to have you.

Mr. Chandler delivered a very interesting address on "Basic Factors in the Future Trend of Business."

Report of Mr. Miller

CHAIRMAN MILLER: This is an experiment that Mr. Lasher and I hatched up a year ago. If it is a success tell us so, and if it is a failure tell us so. Tell the new officers, because this is an entire departure from anything we have tried to do before. I hope you will all have a delightful time.

I had expected to get into a good deal of argument here regarding some of the recommendations that the Board of Directors submitted, and I thought that I would possibly want to just talk without any notes, but for fear that I might, if I do undertake such a procedure, and the hour is getting late—that I might possibly get off on a tangent, possibly say something that I shouldn't, I am going to restrict myself to notes, although I hate to bore you with reading. If you will give me your kind attention, I will stick right to the text.

The loss by death on December 29, 1926, of our beloved secretary, Mr. William C. Ridgway, will be felt for many years to come by this Association. A committee will submit later proper resolutions, but we wish to record here our deep appreciation of the guiding hand of his genius which has for over seventeen years steered the course of development of this organization. The most constant leadership we have enjoyed has been from him, and to have lost him so soon after losing his devoted friend, and our past leader, Mr. W. F. McQuillen, has been a very serious blow to our Association. The situation now calls for still greater service and devotion to our work by those of us who are here to carry on.

At this time also, we wish to express our deep appreciation for the voluntary services of Mr. Mortimer W. Byers, who after twenty-five years of close friendship was so devoted to Mr. Ridgway that he stepped into the break and offered to tide over the work during the interim from Mr. Ridgway's death until we could at this session appoint a permanent secretary.

I want at this time also to express the appreciation of the officers to those five or six men here in New York who stayed with Bill while he was at the hospital day after day, visited him, and cared for him, and when he was gone, helped your officers in carrying on, as we have from that time until this.

We have been the past few weeks interviewing many men who might be suitable to fill Mr. Ridgway's place. I appointed a small committee to act in an advisory capacity, or rather the Board at a special meeting held in December authorized such a committee. We secured Mr. Byers to tide us over, and this Committee also continued to advise with me and to help me in the elimination of applicants or anyone who might be considered for the position.

We are glad to report that the Board of Directors, at its meeting on the 21st, unanimously approved of the employment of Mr. Arthur Chamberlain who will serve as Secretary of the Fine Paper Division of our New York office from March 1, 1927.

Is Mr. Chamberlain in the room? I think he was called out, but he was introduced this morning. I want you all to know him. He is a sterling fellow, a graduate of Brown. He has had nine years of association work in connection with the hardware association. He is enthusiastic, ambitious to make good, and I am sure he is going to do a great deal of constructive work in helping to build up our membership and to render a valuable service.

Your Board of Directors has also decided to transfer to the Chicago Office our Mr. N. A. Schoenbucher, who will be placed in full charge of that office and directly responsible for all secretarial work in the entire Wrapping Paper Division, also educational and research work for both Divisions. In every other regard the Association will continue to function under the some form of organizatin as heretofore. The directors in making this change believe they are taking a step forward. The work of the secretaries for each division has become so extensive that it is not thought possible for one man to satisfy the interests of both divisions. For the past two or three years we have had a good deal of complaint because the time of a secretary was apparently being given unduly to the work of one rather than the other of the divisions. A division of responsibility is never satisfactory and it is hoped that the members will approve this decision and each division will support its secretary 100 per cent and give him every opportunity to develop the work of the division to a far greater degree than it has ever been done heretofore.

I want to lay particular emphasis on this, gentlemen. I don't want any one to say because we have this slight change in our set-up that we are making any fundamental change in

our organization, and we are, therefore, endangering our national unity. That is the furthest from our thoughts. In fact, the real movement is to based on the fact that we want to strengthen our national organization. Our national organizatio is only so strong as its units are strong, and we have had a little feeling that some of our Western local associations, particularly, situated so far from New York were in need of more frequent visits from our secretary and more intensive work. For that reason, we have made this division in the secretarial work, with the idea of strengthening the local unity, strengthening the divisions, tying them together with a Board of Directors and with a President who shall have a Consul and Secretary. I want you to get that very strongly in your minds. Our vote of confidence earlier in this meeting has shown me, however, that you have seen that in the same light that some of the rest of us have, and I appreciate it.

Further in order to strengthen the unity of our National Association, which should be absolutely safeguarded at all times, your Board of Directors recommends the employment as counsel and Secretary to the President and Board of Directors Mr. Mortimer W. Byers, whom you all have met. All activities of both Divisions of the Association will be under the supervision and control of the President and the Board of Directors, thus providing against the possibility of conflict or duplication of effort.

There is a very important point, to safeguard the unity of our Association. I will read it again. All activities of both Divisions of the Association will be under the supervision and control of the President and the Board of Directors, thus providing against the possibility of conflict or duplication of effort.

It is our honest belief that a stronger association will thus be effected and at the same time greater service will be rendered to each Division.

With the aforementioned set-up, we trust that there will be less necessity for the officers of the Association to devote the amount of time and money to our work as has been necessary for the past two or three years.

It will be the duty of each secretary to visit the locals and to enlist a wider interest and participation in both local and national work. We are glad to report that our local associations are in the main in splendid shape. There are a few of them, however, that have felt that they were not getting the service out of the National Association that justified their dues, but we believe with the new set-up we can soon furnish them assistance that will warrant their enthusiastic continuance. In order that you may be familiar with our present membership, I would like to read the names of the following fifteen associations, which constitute the National: It has been rather a surprise to me to find how few of our members know the names of the various associations. If you will bear with me, I would like to read them.

Pacific State Paper Trade Association
Paper Association of New York City
Empire State Paper Trade Association
Wisconsin Paper Merchants Association
Paper Association of Philadelphia
Western Paper Merchants Association
Missouri Valley Paper Association
Baltimore and Southern Association
Northwestern Paper Merchants Association
New England Paper Merchants Association
Central States Paper Trade Association
Middle States Paper Trade Association
Southwestern Paper Merchants Association
Virginia-Carolina Paper Trade Association
Southern Paper Trade Association

The Iowa Association, which was only formed a couple of years ago, a small Wrapping Paper Association, has recently tendered their resignation. We have laid it on the table, however, as I am in receipt of a letter from Mr. Spalding that he believes with the set-up we propose in Chicago, and with a little intensive work, that we can bring him back into the organization.

Our financial situation as shown by the treasurer's report is in a good, healthy condition and we are operating within our means. No change in the set-up for financing will be contemplated until our next semi-annual meeting in October, as our fiscal year ends October 31, 1927. Our assessments have been based on capital rating and there is some growing dissatisfaction with this manner, due to the fact that some concerns are very much under-capitalized and there is an increasing demand for assessments based on sales.

In this connection your Board decided yesterday to appoint a committee composed of the President, two vice presidents, treasurer, and one member at large from each of the divisions—Mr. Stevenson and Mr. Floyd have been appointed—to make a thorough study of our present form of organization and to submit at our next semi-annual meeting their recommendations and also a budget to carry on the work for the succeeding year with a definite plan for the raising of some.

Your President is especially pleased and encouraged by the magnificent attendance and interest shown in this convention, our twenty-third and in many ways the most constructive we have ever held.

I want to say in connection with this assessment on sales which we have considered before in this association work, Mr. Byers made me a very happy suggestion in connection with the same. He says where the member will not agree to send in the sales to our own office for the determining of his dues, or where a member will even refuse to send in his sales to a trust company that we might name for that purpose, in some other associations it has been found satisfactory to arrive at a schedule for the dues and approve that, for so many sales, so much dues, send the schedule to the member and ask him to put down his own amount of dues. Human nature is such that a man will not be likely to put his dues down for less than what his sales are or what he thinks they should be, and the Committee will take under consideration such a plan which will obviate the usual objections which have always been raised when this matter has been suggested heretofore.

The committee meetings and especially the meetings of both Divisions have been the best from point of interest and attendance I have ever witnessed and the Association in spite of our recent trials, I believe to be entering into a new era of growth and productiveness, the like of which has never been experienced. During the past year owing to some misunderstandings and disagreements, and owing to the loss by death of two of our most powerful leaders, we have faced almost a crisis, but we have come through with a greater spirit of devotion and loyalty and gained a larger vision of our possibilities. We, therefore, are not discouraged and we have no reason to be. We have learned from one great lesson I trust from our experiences, the like of which may we never have to weather again. I refer to the repeated passing of recommendations without a dissenting vote, while on the part of many members there apparently was either no intention of following the same or but little intelligence was exercised when their votes were taken.

You will pardon me for making that accusation, gentlemen, but I believe I have cause for it, and I don't believe it is to the best interest of association work. I don't believe it is fair to your leaders, your committees, who are doing the work. I know in many instances you have sat in meetings and voted because you felt, well, these fellows have given a lot of time, and they are good fellows and we want to support them, but that isn't being loyal friends of those men. I claim it is the

height of disloyalty to vote for a thing against your convictions because you like the man that put up the proposition. It isn't fair to him, and some of us have felt it pretty keenly, but I believe now we have passed through that, and we are going on another basis. These committee meetings the last few days have very definitely demonstrated that we are coming now with a new vision and a new sense of responsibility. We are acting on these suggestions in accordance with our own convictions, believing in the end that that is best for the Association.

In general 1926 seems to have been a very satisfactory year for our members. There have been no failures and many report a better year than 1925. More tonnage was handled through our merchants than ever before and while the net profits are generally far below that to be desired or to be expected, our business practices are in the main meeting with general approval and respect on the part of both manufacturers and customers. The reduction of selling and warehouse expense must be more than ever before, the great object for study and work on the part of each division of our Association.

Our relations through our Conference Committees with the manufacturers and with other industries are of the very best and the prospects for the future are exceedingly bright. While we must continue to fight for our own rights and to keep entire control over our own business, at the same time we are always ready to listen in a sympathetic fashion to the problems and wishes of our allies in this ever growing great industry.

The prospects for 1927 are most encouraging. The continuance in the growth of the use of direct by mail advertising and the general prosperity of the business of the country surely holds out a very promising outlook for the paper merchant during this year.

In conclusion, may I thank most heartily all the officers, employed staff and committee members for their loyal and hard work, for their patience and understanding and support of my administration, and may I wish my successor and this Association during the year 1927-28 the greatest growth in members, in unity and solidarity of effort, and the greatest possible degree of respect and confidence of all those in any way connected with the paper industry. (Applause.)

Mr. Schoenbucher, will you kindly give us briefly a statement as to the cost account and educational work?

Remarks by Mr. Schoenbucher

MR. SCHOENBUCHER: I have no report to make. These gentlemen have listened to a lot of very important material at these various meetings, and I know that a great many of them want to get away. I just want to assure the members of the Association on the Atlantic Seaboard that I will probably be back East to visit some of the markets more frequently than I have in the past. I am very happy indeed to believe that these changes which have been made are in the interests of the Association, and I want to speak a word for two mentlemen who are coming into the picture, first Mr. Byers whom I have known for a long time, not very well because I am out of the office most of the time. Mr. Byers steps into the picture at this time when the activities of the Association are the most numerous and the most complicated that they have ever been in its history. He has and will have a great many problems to face which are entirely new, and I know that he is not as hard-boiled as some of you men think he is. I haven't met or known Mr. Chamberlain very well. I have just had two or three words with him but I think you are going to find he is going to be a very good man, and I am going to be very happy indeed to do whatever I can do to make Mr. Byers' lot easier and to make Mr. Chamberlain the most effective instrument that he can possibly be made through the efforts of you men and Mr. Byers and whatever help I can give him, that is humanly possible to make for a man who is stepping into a new picture and will have so many detailed problems to be concerned with and to solve, as he will. Thank you very much. (Applause.)

Report on Statistical Work

CHAIRMAN MILLER: Nothing certainly could make your officers feel more encouraged or happy than the friendly spirit of cooperation shown by our employed staff in the new set-up. I am sure by our semi-annual meeting we will have found it to be a good move.

I want at this time to submit just briefly a report of the statistical work of the association this past year. There were 121 members who reported their Fine Paper sales as against 120 in 1925. You might be interested in knowing how many members we have. There are 232 members enrolled in the Fine Paper Division. That is the largest number that we have ever had reporting that I know of, but it is only about sixty per cent of what it should be. I think the reporting of sales is such a simple matter, and Miss Shepard handles it so efficiently, and it does give you a reflection of the business of the whole country, and if we had 132 reporting, it would be just that much more accurate and those that are not reporting, you are missing something, you are not getting out of your dues something that you should have. Now, come through please and let us all of us report.

There were 94 members reporting their Wrapping Paper sales as against 97 last year. In the Wrapping Paper Division, there are 223 enrolled. I am going to suggest that Mr. Mathewson and Mr. Schoenbucher take this matter up and see if we can't get a larger number of the wrapping paper merchants reporting, because I feel it is a department that the association is carrying on, and it is only fair that all should participate.

Before we take up unfinished business—and I have some that is very important, and I hope that no one will leave that can help it—at the time of Bill Ridgway's death, we appointed a committee to draw up suitable resolutions. Mr. Charles Addoms was Chairman, Mr. Al Corning, Mr. Forest Hopkins, Mr. W. B. Stevenson, and Mr. Fritz Ludingmeyer. I would like to ask Mr. Addoms now to submit the resolutions. I think it would be a little more effective and proper if all the members would stand while we have the reading of the resolutions.

Resolutions on Death of Mr. Ridgway

MR. ADDOMS: The duty was a sad one, but I can assure you we all put our hearts into it. The directions were to draw suitable resolutions, and the committee decided that it would rather have it more in the shape of a memorial perhaps and avoid the "Resolve's and Whereas's." With that in mind, we introduced the resolutions, but that part which is at the end is the part which has been engrossed here and some of you have seen it, and we would like to have everybody look it over.

The resolutions are as follows:

WHEREAS, Mr. Ridgway was a valued member of the paper industry for more than twenty-three years; and

WHEREAS, during that period he was actively identified with the industry as executive secretary of and legal adviser to the National Paper Trade Association; and

WHEREAS, During that period he was of inestimable and constructive assistance to the industry as an executive and counselor; and

WHEREAS, his personality, individuality, and uprightness endeared him to his associates in the industry; therefore be it

RESOLVED, That the following memorial be spread in full upon the minutes of this annual meeting of the National Paper Trade Association, and that two copies of said memorial be suitably engrossed to be presented to the family of Mr. William C. Ridgway, as an expression of our profound sympathy. The National Paper Trade Association of the United States realizes in full measure the irreparable loss sustained in the passing on of our beloved Secretary, William Combs Ridgway, who for more than a score of years acted as our guide, and who during the period of his incumbency performed every duty faithfully and completely, with clear-cut honesty of thought and purpose.

His was an outstanding personality, genial, patient, affable and attentive to all with whom he came in contact—a man of high character, possessing a well balanced mind and retentive memory.

To the end that present and future members may appreciate the creative work and the wisdom exhibited by our much beloved secretary, the officers and the committee appointed for the purpose of drafting this resolution, affix their signatures to this memorial, which has been spread in full upon the minutes.

(Signed) Albert Miller, President; J. C. Mallalieu, Vice President; W. N. Gillett, Vice President; K. S. Warner, Treasurer; Charles Addoms, A. J. Corning, Forest Hopkins, Fritz Lindenmeyr, Wm. B. Stevenson, Committee. February, 1927.

CHAIRMAN MILLER: I shall consider that a unanimous vote has been registered and it will be put on the minutes of the Association.

Mrs. Ridgway's Acknowledgment

"National Paper Trade Association, February 14, 1927.

"Mr. Byers, Acting Secretary:

"Will you please convey to all members of the National Paper Trade Association my appreciation of the many expressions of friendship for my husband, and the beautiful flowers sent at the time of his passing.

"Sincerely,

"Mrs. Jean McBride Ridgway."

Marketing Promotion

From the Fine Paper Division this morning, we had a recommendation that the work of the Marketing Promotion Committee be subscribed from the general fund, providing that the budget would permit it, the sum of two thousand dollars, to bear the expenses already incurred, and those that will be incurred in completing and setting forth a definite program of constructive advertising that will be of benefit to this Association. That program will be submitted at the October meeting, and the program is to be built up around two things, first to put the National Paper Trade Association in its proper place before the users of paper in the United States, and to make our insignia mean something to every man, whether he is a wrapping paper man or a fine paper man. Second, to increase the use and the proper use of more paper and better printing. I think those of you who have seen the preliminary work of this Committee will approve of such a project.

A year ago when I was elected, I said then that I felt one of the greatest constructive objects before this Association was to get behind a program of helping to create a larger, wider and better use of direct by mail advertising. I am very happy that our Fine Paper Division this last year, through this Marketing Committee, has followed through in such a definite and splendid manner, and I would like to entertain a motion that this provision be made. Do I hear the same? I will ask the Secretary to read the resolution.

ACTING SECRETARY: This is the resolution that was adopted at the Fine Paper Division meeting this morning. It will now be read into the minutes of this meeting and if it has your approval please so indicate by definite action.

"Resolved, That the Fine Paper Division formally endorses the program of the Marketing Committee and recommends that the National Paper Trade Association appropriate two thousand dollars from its funds, provided the budget will permit, to reimburse the Committee as may be necessary, and to provide for further expenses incidental to the continuance of their work preparatory to their report at the October meeting."

If it be your pleasure to approve that resolution and instruct the Treasurer to make the disbursement, if the funds of the Association so permit, a motion to that effect is in order.

MR. THOMAS: I so move.

. . . The motion was seconded by Mr. Frank Miller. . . .

CHAIRMAN MILLER: Is there any discussion on that?

MR. CARTER: When I was at luncheon today, a suggestion was made in connection with that appropriation which I would like to pass on. Most paper is sold through the printer, and the obvious suggestion was made that we might cooperate in the spending of that money, if it is for advertising, in conjunction with the Typothetae. I do not make this as an amendment to the resolution, but I merely pass it on as a thought to the Directors and Executive Committee who have the matter in charge.

CHAIRMAN MILLER: Does anyone else want to say anything on this resolution?

I will say that three or four years ago when we first met that was considered one of the objects of such an organization. We have waited now three or four years, and we felt it better to lead the procession, but we will want, no doubt, to take in and have some cooperation from other allies in the industry, but we want primarily to make the triangle, the National Paper Trade Association, the big idea and there is the interest of the Wrapping Paper merchants who otherwise feel that this was only for the interest of the Fine Paper men.

. . . The question was put to a vote and carried unanimously. . . .

Arbitration

Mr. Ebbets, gentlemen, is interested in the American Arbitration Association, and he desires to have this letter addressed to him by the officers of that Association called to your attention. It is dated on the eighteenth instance.

"In accordance with your conversation with our Mr. Braden, it gives us pleasure to submit the following suggestions for the consideration of the Board of Directors of the National Paper Trade Association at its annual meeting, commencing on February 20th.

"The American Paper and Pulp Association is affiliated with our Association and has been fairly active in promoting among its members recourse to arbitration, as an effective and business-like method of settling controversies arising in the paper trade. Arbitration, undoubtedly, can have a greater field of usefulness among members of the National Paper Trade Association than among those in the mill and manufacturing end of your industry. It would give us special pleasure, therefore, to cooperate with you or any Committee your Board of Directors may appoint for that purpose in making the preliminary inquiry into the nature of the controversies that arise among your members or between them and the persons with whom they do business, both buying and selling, and then submit definite plans of suggestion for the establishment of effective arbitral machinery.

"As you know, we are the only national organization that devotes all of its energies to the promotion of commercial arbitration. We have affiliated with us a few hundred of the leading national trade organizations in the country, a partial list of which is attached. If your Board could adopt a resolution endorsing the principle of arbitration and becoming affiliated with us, and also authorize the appointment of a special committee with whom we could cooperate in making the inquiry and preparing the plans proposed, it would expedite such action. Affiliation with our Association does not obligate you financially in any way."

I ought to say that this letter wasn't received by Mr. Ebbets in time for presentation to the Board which met as you know on Monday.

Following the part which I have read there were some suggested resolutions. As long as your Board is no longer in session, gentlemen, with Mr. Ebbets' permission, I may state that a proper disposition of this communication would be for you to direct that it be received and called to the attention of your Board of Directors for their consideration at their next meeting.

MR. EBBETS: I so move.

. . . The moton was seconded. . . .

CHAIRMAN MILLER: If it receives their approval, then it will come up before our next semi-annual meeting.

. . . The question was put to a vote and carried. . . .

Fall Meeting To Be Determined Later

CHAIRMAN MILLER: The Board of Directors approved of the

holding of our next meeting in October in Chicago. The actual date will be determined later, and you will be advised.

We will now proceed to the report of nominations of the Board of Directors as to the officers for the ensuing year.

Formal Election of Officers

ACTING SECRETARY: You will recall that the Board of Directors placed in nomination the following: For President, Mr. J. C. Mallalieu, Vice President Fine Paper, Mr. W. N. Gillett, Vice President Wrapping Paper, Mr. H. W. Mathewson, Treasurer, Mr. Charles Addoms.

. . . Upon motion regularly made and seconded, it was voted that nominations be closed. It was then voted that the Acting Secretary cast the unanimous vote of the Association for the gentlemen named. The vote was cast, and they were declared elected. . . .

MR. MALLALIEU: I would like to say that I accept this office with a full realization of the many duties I am to perform. I consider it a great honor to be given the highest position that this Association gives to any member. I realize that we have had an active, intelligent administration during the past year and that the coming year may suffer by comparison if I do not receive the support of my old friends and my new friends and every member of this Association. Gentlemen, I ask for that support, and I trust I will receive it. (Applause.)

MR. GILLETT: I don't think you want to hear from me any more, gentlemen. I can only say that I am prompted to continue my activity in this Association in this capacity by reason of an article I read the other day in a Chicago paper, an interview by Henry Ford, and I was particularly impressed by one statement he made, and that statement was that no man need be afraid of failure whose original effort is toward progress. Now I am not afraid of failure because I am going to try and be progressive. (Applause.)

MR. MATHEWSON: Gentlemen, I realize the responsibility I have assumed and I assure you that I am going to do everything I can to advance the interests of this Association, and I feel that the meeting we have had this week is so far superior to anything we have had since I have been associated with the National Paper Trade Association in the wrapping paper merchants' interests, that if I come anywhere near it, I will be doing wonderfully well, but I am going to ask for your hearty support, and I assure you that my heart is in the work, and I hope that we will continue to progress. I thank you. (Applause.)

MR. ADDOMS: Gentlemen, this job was wished on me without my knowledge or consent. They took advantage of my absence and my youth. Mr. Warner stands responsible for making me serve. He used to be a friendly competitor, and now I think he is a friendly enemy. But nevertheless I will do my very best for you, and I don't need your support, because the fewer demands you make on me the better I will like it. Thank you very much. (Applause.)

. . . The meeting adjourned at four-thirty o'clock. . . .

NOT FOR EXPORT TAX ON PULPWOOD

The report that Cape Breton County has voted in favor of a tax of $2.00 per cord on pulp wood shipped out of the province is incorrect. As the report gives an erroneous impression of the recent developments in Nova Scotia in connection with the embargo and Export Tax the facts are printed herewith.

There are twenty-four Municipalities in the Province. The annual meeting of one has not yet taken place. Of the twenty-three only one has voted for Embargo or Export Tax. One deferred action in the matter. Two took a neutral stand. Nineteen voted against Embargo or Export Tax, twelve of them unanimously, and the other seven by substantial majorities. In only one case in the whole twenty-three Councils was the vote along partisan lines. In every other instance the Resolution was moved by a Conservative and seconded by a Liberal.

CENSUS OF PAPER BOX CONCERNS

The Department of Commerce announces that, according to data collected at the biennial census of manufactures taken in 1926, the establishments engaged primarily in the manufacture of paper boxes and of decorated and fancy covered metal boxes reported, for 1925, a total production valued at $281,943,969, an increase of 6.7 per cent as compared with $264,209,159 for 1923, the last preceding census year.

The total for 1925 is made up as follows: Shipping containers, corrugated and fiber, $85,131,278; set-up paper boxes, $9,657,940; cartons and folding boxes, $6',785,202; paper cans, $9,931,949; decorated, lithographed, lacquered, and fancy covered boxes, $14,-842,776; paper boxes not specifically reported by class, $711,-353; miscellaneous products, $13,883,471.

In addition, paper boxes are manufactured to a considerable extent as secondary products by establishments engaged primarily in other industries. The value of such boxes thus made outside the industry proper in 1923 was $26,845,705, an amount equal to 10.2 per cent of the total value of products reported for the industry as classified. The corresponding value for 1925 has not yet been calculated, but will be given in the final report of the present census.

Of the 1,229 establishments reporting for 1925, 325 were located in New York, 142 in Pennsylvania, 122 in Massachusetts, 112 in Illinois, 67 in Ohio, 65 in New Jersey, 52 in Missouri, 43 in California, 43 in Connecticut, 28 in Maryland, 27 in Wisconsin, 21 in India, 21 in Michigan, and the remaining 161 in 26 other States.

The statistics for 1925, as presented herewith, are preliminary and subject to such correction as may be found necessary upon further examination of the returns.

	1925	1923	Per cent of increase
Number of establishments	1,229	1,216	1.1
Wage earners (average number)(a)	57,148	56,855	0.5
Maximum month	Nov. 62,083	Nov. 60,386	..
Minimum month	June 54,417	Jan. 54,096	..
Per cent of maximum	87.7	89.6	..
Wages (b)	$57,172,027	$53,965,852	5.9
Cost of materials (including fuel and electric power)(b)	$151,711,699	$144,079,470	5.3
Products, total value(b)	$281,943,969	$264,209,159	6.7
Shipping containers, corrugated and fiber	$85,131,278	(c)	..
Set-up paper boxes	$95,657,940	(c)	..
Cartons and folding boxes	$61,785,202	(c)	..
Paper cans	$9,931,949	(c)	..
Decorated, lithographed, lacquered and fancy covered boxes	$14,842,776	(c)	..
Not specifically reported by class	$711,353	(c)	..
Miscellaneous products	$13,883,471	(c)	..
Value added by manufacture(d)	$130,232,270	$120,129,689	8.4
Horsepower	76,186	61,687	23.5

(a) Not including salaried employees.

(b) The amount of manufacturers' profits can not be calculated from the census figures for the reason that no data are collected in regard to a number of items of expense, such as interest on investments, rent, depreciation, taxes, insurance, and advertising.

(c) No comparable data.

(d) Value of products less cost of materials.

1000 SHEET PLAN IN NEW ENGLAND

In a notice to the trade in regard to the thousand-sheet plan, in effect February 14, Floyd H. Blackman, secretary of the New England Paper Merchants Association and the Fine Paper Division of that body, announces as follows: "For the present, packages and cases will be labeled with both the old substance number and the new 1,000 sheet weight. The 1,000 sheet system is adopted by this association for elimination of waste, simplification of figures, and standardization of printing papers."

BOSTON PAPER TRADE BANQUET

The annual meeting and banquet of the Boston Paper Trade Association will be held at the Algonquin Club March 16.

Eliot Wadsworth is to be the speaker.

Those Who Attended the Convention

The following is the official registration of the National Paper Trade Association of the U. S. A.

A

Jas. E. Alcorn, Alling & Cory Co., Cleveland, Ohio.
C. W. Andrews, C. R. Andrews Paper Co., Pittston, Pa.

B

M. Band, City Paper Co., Birmingham, Ala.
Nicholas J. Barrett, Thomas Barrett & Son, New York.
Bolling W. Barton, Barton, Duer & Koch Paper Co., Baltimore, Md.
Leon Beck, Charles Beck Co., Philadelphia, Pa.
C. L. Beckett, H. W. Carter Paper Co., Springfield, Mass.
G. E. Beggs, Hubbs & Hastings Paper Co., Rochester, N. Y.
Edward D. Bement, Chas. A. Esty Paper Co., Boston, Mass.
M. Berlau, Berlau Paper House, Kansas City, Mo.
Arthur W. Blackman, D. F. Munroe Co., Boston, Mass.
H. L. Blake, Fort Hill Paper Co., Boston, Mass.
B. F. Bond, Jr., B. F. Bond Paper Co., Baltimore, Md.
Charles N. Bond, C. M. Rice Paper Co., Portland, Me.
L. R. Boswell, Minneapolis Paper Co., Minneapolis, Minn.
Jas. E. Bradley, Bradley-Reese Co., Baltimore, Md.
Arthur L. Brown, Diem & Wing Paper Co., Cincinnati, Ohio.
Chas. D. Brown, Bradner, Smith & Co., Chicago.
Herbert S. Brown, Carter, Rice & Co., Corp., Boston, Mass.
J. L. Buchanan, Chope-Stevens Paper Co., Detroit, Mich.
E. W. Buckley, Western Pacific Paper Co., Los Angeles, Cal.
Richard S. Bull, Bradner-Smith & Co., Chicago.
Matthew O. Byrne, Whitney Bros., Inc., Boston, Mass.

C

G. E. Carpenter, Carpenter Paper Co., Omaha, Neb.
J. A. Carpenter, Kansas City Paper House, Kansas City, Mo.
Herbert L. Carter, Carter, Rice & Co., Corp., Boston, Mass.
G. E. Caskie, Jr., Caskie-Dillard Co., Inc., Lynchburg, Va.
R. A. Cauthorne, Cauthorne Paper Co., Richmond, Va.
Alan Chandler, Alling & Cory Paper Co., Pittsburgh, Pa.
John A. Church, Cincinnati Cordage & Paper Co., Cincinnati, Ohio.
John W. Clancy, Southeastern Paper Co., Louisville, Ky.
Robert G. Clayton, Sheridan-Clayton Paper Co., St. Joseph, Mo.
A. D. Cleveland, E. C. Palmer & Co., Ltd., New Orleans, La.
S. B. Clifford, C. P. Lesh Paper Co., Indianapolis, Ind.
N. A. Considine, Paper House of Pennsylvania, Philadelphia, Pa.
A. J. Corning, Hubbs & Corning Co., Baltimore, Md.
J. V. Cuskey, Dixie Cups, Easton, Pa.
G. G. Custer, W. F. Nackie Paper Co., Milwaukee, Wis.

D

A. C. Damon, Paul E. Vernon & Co., New York.
S. S. Dillard, Dillard Paper Co., Greensboro, N. C.

E

E. A. Eaton, A. M. Eaton Paper Co., Boston, Mass.
Wm. E. Ebbetts, Coy, Disbrow & Co., New York.
F. J. Edmonds, Wausau Paper Mills Co., Brokaw, Wis.
F. H. Epes, Epes-Fitzgerald Paper Co., Richmond, Va.
Charles A. Esty, Chas. A. Esty Paper Co., Boston, Mass.

F

Nelson Feeley, Strathmore Paper Co., Mittineague, Mass.
C. R. Field, Field-Hamilton-Smith Paper Co., Omaha, Neb.
F. E. Floyd, Crescent Paper Co., Indianapolis, Ind.
F. Forchhumer, Chatfield & Woods Co., Pittsburgh, Pa.
Fred F. Fox, Crescent Paper Co., Indianapolis, Ind.
Jerome Franc, Franc-Graham Paper Co., Inc., New York.
Max Frank, John Carter & Co., Boston, Mass.
J. Friedman, City Paper Co., Birmingham, Ala.
Alfred Fuhlage, Beacon Paper Co., St. Louis, Mo.

G

Glenn Gaines, Crescent Paper Co., Indianapolis, Ind.
Lhoyd Gardner, R. L. Greene Paper Co., Providence, R. I.
George H. Giddey, Beecher, Peck & Lewis, Detroit, Mich.
W. N. Gillette, Chicago Paper Co., Chicago.
William R. Grazelle, Holland Paper Co., Buffalo, N. Y.
I. Greenbaum, Washington Paper Co., Washington, D. C.

H

Arthur C. Hall, John Carter & Co., Inc., Boston, Mass.
Edgar A. Hall, Jr., Pilcher-Hamilton Co., Chicago, Ill.
Herbert C. Ham, Arthur E. Ham & Sons, Boston, Mass.
W. C. Hamilton, Pilcher-Hamilton Co., Chicago.
Lou L. Hanlan, Alling & Cory Co., Buffalo, N. Y.
A. Richard Hartung, A. Hartung & Co., Philadelphia, Pa.
Walter E. Hastings, Hubbs & Hastings, Rochester, N. Y.
Harold Helmer, Beecher, Peck & Lewis, Detroit, Mich.
W. J. Hermann, E. A. Boner Co., Milwaukee, Wis.
Roth F. Herrlinger, Union Selling Co., Cincinnati, Ohio.
W. H. Holden, Holden & Hawley, New York.
W. B. Holliday, Union Paper & Twine Co., Buffalo, N. Y.
A. J. House, Union Paper & Twine Co., Detroit, Mich.
Hartley A. Hurlbut, Hurlbut & Hatfield, Boston, Mass.

I

H. G. Ihsen, Hubbs & Howe Co., Cleveland, Ohio.
M. E. Immerwahr, Import Paper Co., Chicago.
Chester C. Irving, Falulah Paper Co., Fitchburg, Mass.
Nathan D. Isen, Enterprise Paper Co., Philadelphia, Pa.

J

F. T. Jamison, Interstate Cordage & Paper Co., Pittsburgh, Pa.
S. M. Johey, Seaman Paper Co. of Missouri, St. Louis, Mo.
Dean Y. Johnston, Chatfield & Woods Co., Cincinnati, Ohio.
Geo. S. Johnston, Western Newspaper Union, Omaha, Neb.
Sydney Jones, Hudson Valley Paper Co.
J. B. Jones, Western Paper Co., Omaha, Neb.
Robert S. Johnston, Old Dominion Paper Co., Norfolk, Va.
B. A. Judd, Petrequin Paper Co., Cleveland, Ohio.

K

Harry Keffer, Johnston Paper Co., Harrisburg, Pa.
R. C. Kettles, Jr., C. F. Hubbs & Co., New York.
T. F. Keuned, S. Walter, Inc., Philadelphia, Pa.
Geo. A. Keyser, Industrial Paper Co., Baltimore, Md.
A. N. Kimmey, Chas. Beck Co., Philadelphia, Pa.
Chas. Koch, Barton, Duer & Koch Paper Co., Washington, D. C.
M. L. Kratz, Alling & Cory Co., Buffalo, N. Y.
Alfred Kuni, J. E. Linde Paper Co., New York.

L

Spencer Lathrop, Lasher & Lathrop, Inc., New York.
Eugene H. Lazenby, Industrial Paper Co., Baltimore, Md.
Harry Lefkowith, S. Walter, Inc., Philadelphia, Pa.
H. A. Lengnich, H. A. Lengnich Co., Baltimore, Md.
Perry W. Lesh, C. P. Lesh Paper Co., Indianapolis, Ind.
John Leslie, John Leslie Paper Co., Minneapolis, Minn.
G. R. Likius, Springfield Paper Co., Springfield, Mo.
Carl E. Lincoln, Bradner-Smith & Co., Chicago.
B. W. Lipscomb, Richmond Paper Co., Richmond, Va.
F. R. Lloyd, Baltimore, Md.
F. W. Lotz, F. W. Lotz Paper Co., Dayton, Ohio.

M

J. M. McClellan, Jr., Birmingham Paper Co., Birmingham, Ala.
James McCracker, Riegel & Co., Inc., Philadelphia, Pa.
C. G. McGehee, Jacksonville Paper Co., Jacksonville, Fla.
T. A. McGrane, D. P. Winnie Co., Inc., New York.
Wm. McHenry.
Geo. McKinney, F. A. Flinn, Inc., New York.
W. C. McLaughlin, Union Paper & Twine Co., Detroit, Mich.
W. J. McLellan, Carter, Rice & Co., Boston, Mass.
G. A. Manz, J. S. B. Garrett Co., Syracuse, N. Y.
Oswald F. Marquardt, Marquardt, Blake & Decker, Inc., New York.
L. J. Marshall, Marshall Paper Co., Appleton, Wis.
H. W. Mathewson, Paper Supply Co., Minneapolis, Minn.
Ernest C. Mead, Richmond Paper Co., Richmond, Va.
Karl F. Meyer, Schwarz Paper Co., Lincoln, Neb.
S. L. Meyer, Louisiana Paper Co.
O. W. Mielke, Blake, Moffitt & Towne, Portland, Ore.
A. M. Miller, Central Ohio Paper Co., Columbus, Ohio.
J. F. Miller, Chope-Stevens Paper Co., Detroit, Mich.
O. H. Miller, Central Ohio Paper Co., Columbus, Ohio.
R. E. Milligan, Seaman-Patrick Paper Co., Detroit, Mich.
W. F. Moody, G. W. Moody & Son, New Castle, Pa.
J. L. Murray, Mutual Paper Corp., Seattle, Wash.
R. E. Myers, R. M. Myers & Co., Rochester, N. Y.

N

James Nelson, Central Topeka Paper Co., Topeka, Kans.
A. H. Newell, Jackson Paper Co., Jackson, Miss.

O

H. C. Orchard, Orchard Paper Co.

P

Thomas J. K. Parker, Stone & Andrew Co., Boston, Mass.
J. F. Peacock, Cleveland Paper Mfg. Co., Cleveland, Ohio.
Harvey E. Platt, J. L. N. Smythe Co., Philadelphia, Pa.
F. W. Power, Carter, Rice & Co., Boston, Mass.
D. W. Prath, Butler Paper Corp., Chicago, Ill.
E. S. Pratt, Pratt Paper Co., Des Moines, Iowa.

R

Bert E. Reeves, Alling & Cory Co., Rochester, N. Y.
Otto W. Renner, Pittsburgh, Pa.
W. A. Rhodes, S. P. Richards Paper Co., Atlanta, Ga.
W. Otis Roe, Individual Drinking Cup Co., Easton, Pa.
Henry Roesch, Roesch Paper Co., Tampa, Fla.
R. Roesch, Union Paper & Twine Co., Cleveland, Ohio.
L. E. Rogers, Bowes Bros., Inc., Utica, N. Y.
Nathan Rosenthal, Rosenthal Paper Co., St. Louis, Mo.
William H. Rourke, Rourke-Eno Paper Co., Hartford, Conn.

S

H. L. Samson, Domestic Mills Paper Co., New York.
Nathaniel Saxer, Saxer Paper Co., Philadelphia, Pa.
Morris Schlosser, M. & F. Schlosser, New York.
Edward J. Schmidt, Parke, Thomas & Tucker Paper Co., Chicago.
C. F. Schwarz, Schwarz Paper Co., Lincoln, Neb.
Sidney L. Schwarz, Schwarz Paper Co., Chicago.
Walter Seinsheimer.
H. J. Severance, Hubbs-Howe & Co., Buffalo, N. Y.
A. H. Seyler, Cleveland Paper Mfg. Co., Cleveland, Ohio.
Charles A. Shaw, Whitney Bros., Inc., Boston, Mass.
Erwin J. Sherrick, Pilcher-Hamilton Co., Chicago.

Those Who Attended the Convention

A. B. Sherrill, Riegel & Co., Philadelphia, Pa.
H. Shumock, Globe Paper Co., Cleveland, Ohio.
W. T. Sibley, Alling & Cory Co., Buffalo, N. Y.
Andrew Simon, Charles Beck Co., Philadelphia, Pa.
Arthur H. Smith, Alling & Cory Co., Pittsburgh, Pa.
Jay K. Smith, J. & F. B. Garrett Co., Syracuse, N. Y.
Thos. F. Smith, Louisville, Ky.
T. H. B. Smythe, J. L. N. Smythe Co., Philadelphia, Pa.
Wm. R. Steltenpohl, Paragon Paper Co., Cincinnati, Ohio.
W. B. Stevenson, Storrs & Bement Co., Boston, Mass.
Robert M. Stone, Stone & Forsyth Co., Boston, Mass.
Henry Striebert, Streibert Paper Co., Albany, N. Y.
Chas. L. Streeter, Surgart Paper Co., Chicago, Ill.
George H. Strott, New York Paper Co., Baltimore, Md.
P. A. Stuhlreyer, Diem & Wing Paper Co., Cincinnati, Ohio.
Fred Stutzman, Holland Paper Co., Inc., Buffalo, N. Y.

T

A. D. Tayloe, Tayloe Paper Co., Memphis, Tenn.
H. A. Thayer, Carter, Rice & Carpenter Co., Denver, Col.
A. C. Thomas, F. A. Flinn, Inc., New York.
F. K. Thompson, Cramer-Force Co.
Morgan H. Thomas, Garrett-Buchanan Co., Philadelphia, Pa.
H. B. Thurston, Conrow Bros., New York.
F. Bendel Tracy, Fort Hill Paper Co., Boston, Mass.

V

Theo. H. Van, Van Paper Supply Co., St. Paul, Minn.

W

H. E. Waite, John Carter & Co., Inc., Boston, Mass.
Edw. T. Walter, Wilcox-Walter-Furlong Paper Co., Philadelphia, Pa.
Simon Walter, S. Walter, Inc., Philadelphia, Pa.
James O. Warner, O. F. H. Warner Paper Co., Baltimore, Md.
K. S. Warner, John F. Sarle Co.
Sidney L. Wellhouse, National Paper Co., Atlanta, Ga.
Jas. L. Wells, Sloan Paper Co., Atlanta, Ga.
Robert H. Welsh, Carter, Rice & Co., Boston, Mass.
Carl C. Whitaker, Cauthorne Paper Co., Richmond, Va.
James G. White, James White Paper Co., Chicago, Ill.
M. V. Wiggins, Crescent Paper Co., Indianapolis, Ind.
C. A. Wilder, Wilder Bros. Co., Philadelphia, Pa.
T. F. Wilder, Willis & Weber Paper Co., Kansas City, Mo.
F. K. Williams, Caskie-Dillard Co., Lynchburg, Va.
W. S. Wilcox, Wilcox, Walter, Furlong Paper Co., Philadelphia, Pa.
F. W. Wilson, Blake, Moffitt & Towne, San Francisco, Cal.
B. W. Wilson, B. W. Wilson Paper Co., Richmond, Va.
C. J. Wittrock, Paragon Paper Co., Cincinnati, Ohio.
J. Wolbrette, Southern Paper Co., Ltd., New Orleans, La.
Fred P. Wood, Simplex Paper Corp., Adrian, Mich.
E. E. Wright, Miller & Wright Paper Co., New York.

Y

Charles W. Young, Carter, Rice & Co., Boston, Mass.

Z

H. L. Zellerbach, Zellerbach Paper Co., San Francisco, Cal.
J. W. Zimmerman, Standard Paper Co., Cincinnati, Ohio.

BOX MEN MEET AT DEL MONTE

About two score of the paper box manufacturers of California, partly from Los Angeles and the rest from San Francisco, spent three pleasant days at Del Monte during the week of February 7-12. Apparently the meeting was called for the purpose of getting together in a friendly conference as very little business was attempted or done. On the second day a meeting lasting a part of the forenoon was held at which some matters of interest to the industry was discussed, but for the most part the three days were devoted to visiting and golf. Representatives were present from both factors in the box manufacturing business, both set up and folding. The annual convention of the Pacific Coast Box Manufacturers Association will be held at Del Monte during the month of June, 1927, but the exact dates have not as yet been decided upon.

While a number of the folding paper box manufacturers from Los Angeles went to the conference nothing eventuated relative to reviving an association here. Charles A. Elvin, who was appointed secretary some time ago, is working upon an association project and says he hopes to get the manufacturers together on some sort of an arrangement before long. At any rate, he hopes to have something tangible to report before the time of the June convention.

There is nothing of moment to relate at the present time regarding the paper industry in general. Most of the Los Angeles jobbers repeat what they said a week ago, namely, that the present volume of trade is holding up very satisfactorily and all profess to be well pleased both with the present condition and with the prospects for the immediate future at least.

Collections likewise indicate no change for the better or for the worse. Admittedly they are slow at the best and every collection department is hard after its debtors. However, with the abundance of rainfall Southern California has experienced this winter business ought to improve and with it collections as well.

LEAVES McLAURIN-JONES CO.

George Goodsir has resigned as vice president and a director of the McLaurin-Jones Company, of Brookfield, Mass. Mr. Goodsire has long been connected with the gummed paper industry. For several years he was secretary and general manager of McLaurin Brothers, who imported gummed papers into this country from the Smith & McLaurin mills in Glasgow, Scotland. He was one of the originators of the Ideal Coated Paper Company, of which he was a director since its inception in 1906, and in 1910, when the Payne-Aldrich tariff bill became law, he went to Scotland to bring about an amalgamation of McLaurin Brothers and the Ideal Coated Paper Company, which was put into effect upon his return to this country. He then actively joined the Ideal Company as its vice president.

In the latter part of 1921 the McLaurin-Jones Company was incorporated to take over the mills of the Ideal Coated Paper Company of Brookfield, Mass., and Chicago, Ill., Samuel Jones Company of Newark, N. J., and the Ware Coated Paper Company of Ware, Mass., which were amalgamated at that time, and Mr. Goodsir was elected vice president and a director of the new company, which position he has held up to the time of his resignation.

Mr. Goodsir stated that he had made no definite plans for his future, but that in all probability he would remain in the industry, and that when he had definitely decided along these lines, he would announce the fact to his many friends in the trade throughout the country.

Mr. Goodsir is also president of the National Association of Gummed Tape Manufacturers which is affiliated with the American Paper and Pulp Association.

I. P. CO. AND RAYON MANUFACTURE

The following statement accompanies current dividend cheques of the International Paper Company:

"The Kipawa Mill of your company is located on the Ottawa River at Temiskaming, Quebec, two hundred and thirty miles above the city of Ottawa, and has a daily capacity of 250 tons of the highest grade bleached sulphite pulp. A large part of its output is shipped throughout the world for the manufacture of rayon (artificial silk).

"Sulphite pulp for rayon manufacture is the highest grade of pulp made. The greatest technical control is exercised during manufacture at Kipawa Mill. When dried, the pulp is cut into sheets of exact size and baled in waterproof packages. The doors of the railway cars in which the pulp is shipped are sealed with waterproof paper to prevent damage during transit.

"Your company owns, tributary to the Kipawa Mill, 4,000 square miles of Crown lease timberlands, all of the logs being delivered to the mill by water. The wood is practically all spruce, which is particularly suitable for high grade sulphite pulp."

The Problem of Pulpwood Supply in Lake States

Delivered at the Meeting of the Woodlands Section by Raphael Zion, Director, Lake States Forest Experiment Station, University Farm, St. Paul, Minn.

The Lake States rank below only the New England States and the Middle Atlantic States as a center of pulp and paper production. The pulpwood situation in the Lake States region, including Michigan, Wisconsin, and Minnesota, is briefly this.

The principal species used for pulpwood and paper manufacture are, in the order of their importance, spruce, hemlock, balsam fir, jack pine, popple (aspen), and tamarack. The use of white and red pine for pulpwood is negligible and may be left out of consideration. As regards the available supply of these species, the situation is different. Hemlock is the most abundant, closely followed by jack pine and popple. The least abundant are spruce, tamarack, and balsam fir. This is clearly shown from Diagram 1 in which the consumption and the available supply of each species are contrasted. A mere glance at the diagram shows where the difficulty lies. It is centered in spruce.

Although spruce is the species most used in pulp and paper production, it occupies practically one of the last places as regards the available total supply. With an annual consumption of nearly 675,000 cords, including the importations, there is a visible supply of only 10,000,000 cords in the whole region. This, even without allowing for expansion of the industry, would indicate only about 15 years of life.

Spruce in Individual States

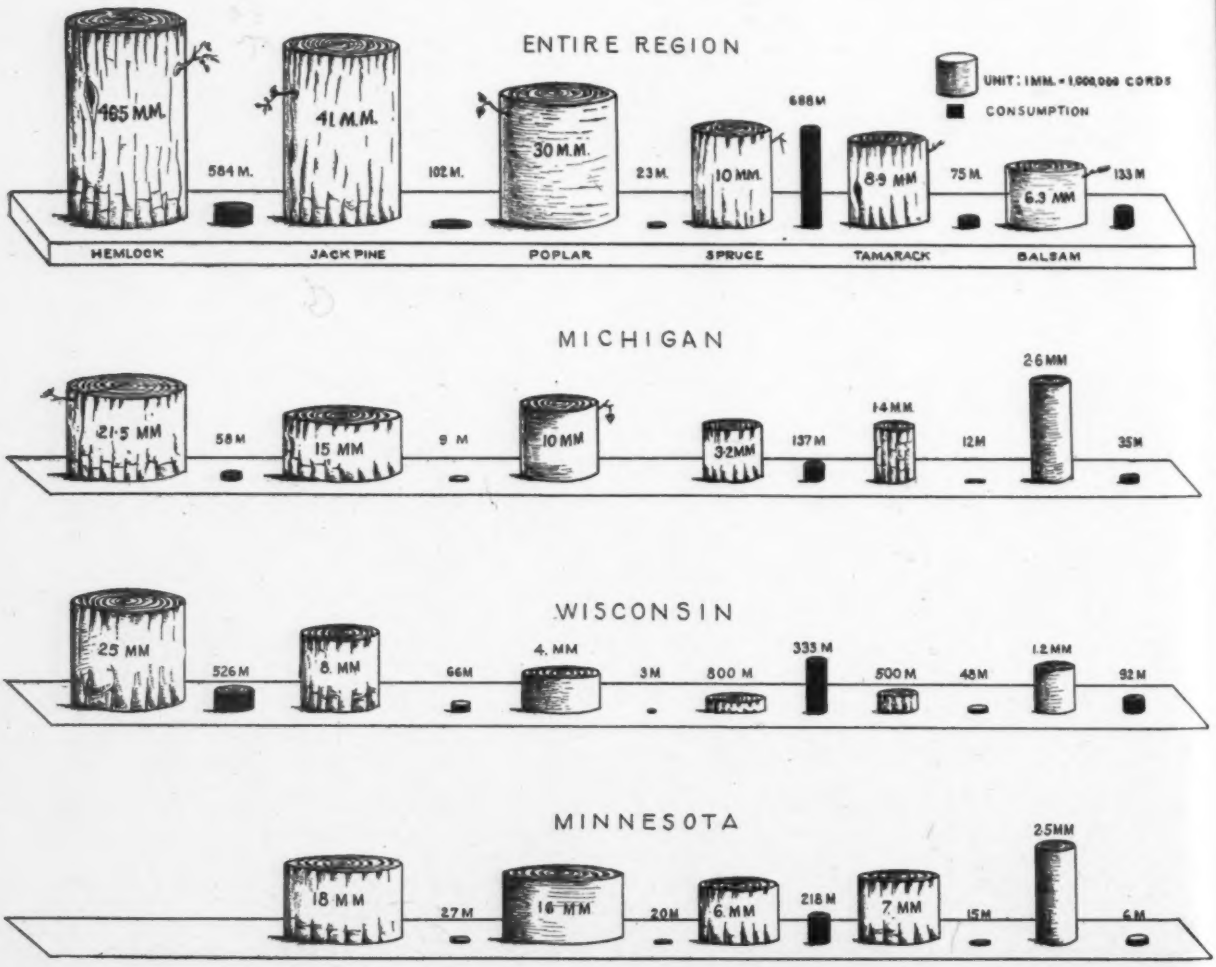
The spruce situation in individual states is even more striking.

Wisconsin, which used in 1924 about 333,000 cords of spruce pulpwood, has a visible supply of only 800,000 cords, or if forced to depend on its own resources, would exhaust it in 2 or 3 years.

In Michigan the situation is only a little better. There the consumption of spruce in 1924 was some 137,250 cords, while the total estimated stand is 3,200,000 cords, or a potential supply, for its own needs, for nearly 25 years.

In Minnesota against an annual consumption of spruce pulpwood of only 218,250 cords, there is a total stand of some 6,000,000 cords, or a supply which would be sufficient for its own needs at the present rate of consumption for nearly 30 years. Both Michigan and Minnesota, however, supply large quantities of spruce

PULPWOOD SUPPLY AND CONSUMPTION IN THE LAKE STATES



pulpwood to Wisconsin, and, therefore, will exhaust their supplies within about 15 years.

Hemlock Still Plentiful

Hemlock, the second important species from the standpoint of the pulp and paper manufacturer, is still plentiful in both Michigan and Wisconsin, although Michigan has most of it. Minnesota has no hemlock at all. The annual consumption of hemlock pulpwood in 1924 in the region as a whole was about 584,000 cords against a supply of 46,500,000 cords. If all the hemlock were available for pulpwood, and this may easily be, hemlock would last for nearly 80 years at the present rate of consumption. Wisconsin alone, if all the hemlock were available for pulpwood, has now available a supply for nearly 50 years, and Michigan almost indefinitely. Yet the hemlock supplies will last only as long as the hardwood supplies will last. Hemlock is invariably associated with the hardwoods. If the hardwoods are cut clean as they are being cut now, most of them will be gone in 25 years, and hemlock will be gone too.

Balsam Fir

The third species most in demand—balsam fir—at the present consumption would last in the region for nearly 50 years. Balsam comes nearest to spruce and is being used together with it. As regards supplies of balsam, Wisconsin is again in worse shape than either of the other two states. With a total stand of only 1,200,000 cords, its own supply would last only about 13 years, while in Michigan and Minnesota the consumption of balsam-fir is small and the available supply is still comparatively ample.

Jack Pine

Jack pine—the species that is being increasingly used for pulpwood—has a stand of 41,000,000 cords, and a consumption of close to 102,000 cords. The supply at the present rate of consumption, if it were used only for pulpwood, would last for a long time. Much more of it is cut now for lath and lumber than for pulpwood. It will depend largely upon the comparative demand for the two uses that will determine its availability for pulpwood. The situation is also extremely favorable as regards popple with an estimated stand of 30,000,000 cords and an annual consumption of only 23,500 cords. The supplies of jack pine and popple pulpwood, while the distribution in the three states is not even, are ample for both uses—lumber and pulpwood.

The Crux of the Problem

The crux of the whole problem, then, in the Lake States, and especially in Wisconsin, just as in New England and New York, is the supply of spruce and balsam fir.

The open market supply of spruce at reasonable prices will be exhausted, according to those familiar with the region, within 10 years. Few mills, however, depend wholly upon the open market supply, but very few also have a supply that will last them more than 40 years. A number of mills have a supply of spruce that at the present rate of production will last them about 20 years.

Of the six pulpwood species—spruce, balsam, hemlock, jack pine, popple and tamarack—spruce is adapted to mechanical, sulphite, sulphate, and soda processes, but is principally used for news print paper as ground and sulphite pulp. Balsam fir is very similar to spruce and is worked largely for news print in mechanical and sulphite processes. Hemlock, although it can also be worked in all four processes, is chiefly used as sulphite pulp for news print, and when bleached, also for book paper. Jack pine is used as sulphate pulp and also in a modified sulphite process for kraft paper, and, when bleached, is used to some extent for book paper. Popple is worked almost exclusively by the soda process for book paper. Tamarack makes a sulphate pulp and when well seasoned, also a sulphite and is used for kraft paper.

The shortage of spruce affects most seriously, therefore, the manufacturer of news print paper, as spruce is one of the basic raw materials for the news print mills. The situation as regards the production of craft and book paper is not acute and need not become acute if steps are taken now to safeguard that supply of raw material. The Lake States region has the advantage over New England and the Atlantic States in that it has still a large supply of hemlock, jack pine, and popple which, if taken in hand now, could be made to last indefinitely.

The Problem of the Manufacturer

What course is open, then, to the manufacturers of news print paper, with the exhaustion of the spruce supplies not far distant? The easiest attitude to take is that of Louis XIV before the French Revolution, "Apres nous le deluge." We should worry what is going to happen after 20 years. We know what happened to Louis XIV. Some mills may, as a few have already done, shift gradually from the production of news print paper to other kinds of paper—craft or book paper, or to increased use of hemlock at the expense of spruce in sulphite process. Another possible solution may be sought in increasing the importations of spruce from Canada. Recent experience does not augur well for such a solution. Some may base their hopes on new chemical processes by which other species than spruce can be made serviceable in the manufacture of news print paper. Even today some species of wood can be made into news print paper. This news print, however, is still of inferior quality.

With all due respect to our cellulose chemists, it is doubtful in my mind if spruce wood will soon be eliminated as the most suitable raw material for news print. If even a new chemical process is discovered which would make practicable the use of other species for news print, this new news print will have to be equal in quality, and even possibly a little better than spruce pulpwood, to offset the competition from Canadian and Scandinavian spruce news print. The Scandinavian countries with their well-managed spruce forests are building their future pulp and paper industry entirely on spruce. It would be safer for our own industry not to depend too much on the revolutionary changes in the chemistry of cellulose which would make other species "just as good" as spruce for news print.

Finally, some may seek solution in better handling of the remaining supplies of spruce so as to prolong its life through forest practice.

Black Spruce Most Prevalent

The Lake States, even when the country was still blessed with abundant forests, was never richly endowed with spruce timber. Black spruce is the most prevalent species. The upland or white spruce occurs scatteringly throughout northern Wisconsin and Michigan. Only in a few northern counties of Minnesota does it occur at all more or less abundantly in mixture with other species. Unlike the red spruce of the east, the black spruce is a swamp species. It is confined almost exclusively to peat swamps. There are at least 5,000,000 acres of spruce peat swamps. Of these about 2,500,000 acres are in Minnesota, 2,000,000 acres in Michigan, and only 500,000 acres in Wisconsin. The present merchantable black spruce forests are more than 100 years old and over large areas do not average more than 8 to 12 cords to the acre. The forest is made up of trees of various diameters. Trees 3 inches in diameter are often 70 to 80 years old, and maybe 150 to 200 years. Yet this slow growth is not inherent in the tree itself, but is due to the conditions under which it grows. On the drier sites black spruce can be grown in from 50 to 60 years for pulp, and it will average about 6 inches in diameter. Balsam fir, although as a rule a swamp tree, does even better than spruce on the better sites.

Foresters Not Magicians

Inquiries that most commonly come to the Station from pulp men run something like this: "We have still a cut of spruce to last our mill for the next 20 years. What should we do to provide for the future? Can we plant spruce now so that it would be ready for cutting at the end of 20 years when our present supply is gone?" Now, foresters are not magicians. They are working with the slower forces of nature and nature must take its course. We have records of plantations of Norway and white spruce which show remarkable growth. In one plantation of Norway

spruce in Wisconsin, 34 years old, measurements showed over 1,000 trees to the acre ranging from 2 inches to 10 inches in diameter, the average diameter being a little less than 6 inches. The average height is 42 feet and some of the largest trees are 60 feet high. The total volume per acre in the trees 6 inches and over in diameter is 43 cords. In other words the spruce plantation grew at the rate of 1¼ cords per acre per year, and after only 34 years is now ready to be cut, although the stand is still growing as fast or faster than before. Similar records of individual plantations exist here and there throughout the region, yet it would not be safe to count on such a growth over large areas. Under average conditions and over large areas we should count in white spruce plantations on a growth of not less than ½ cord and not more than ¾ of a cord per acre per year, and at least 50 years before the stand is merchantable for pulpwood. Planting of spruce, therefore, even if it is begun today, could not produce enough spruce pulpwood within 20 years to meet the exhaustion of the supply as the shortest period which must be allowed for spruce plantations to reach pulpwood size is 50 years.

Planting alone, then, cannot solve the problem. Planting, however, combined with other forest operations, may be able to assure a continuous supply of spruce pulpwood.

The slow growth of our black spruce which constitutes the bulk of our spruce forests in the region, as has already been pointed out, is not inherent in the trees, but is due to unfavorable conditions under which it grows in the swamps. Much of the spruce in Scandinavian countries is also found in swamps, and there, through improvement in the soil conditions in the swamp, the yields of the swamp forests have been doubled and trebled. In a typical black spruce swamp, the growth is from 1/10 to 1/6 of a cord, or from 10 to 15 cubic feet per acre per year. Such swamp forests at their present rate of growth do not lend themselves to profitable forest management, especially by private timber land owners.

Cause of Slow Growth

The cause of the slow growth of the swamp forest trees lies in the soil conditions of swamp forests. In a typical spruce swamp forest of the north, this soil is peat, varying from 20 feet in depth to just a few inches. The soil is very loose, offering little firm support to the roots of the trees. The soils thaw out later in the spring and get chilled earlier in the fall, than highland soils. The growing season is, therefore, shorter than upland forests sometimes by as much as six weeks. The soil temperatures during the growing season are low, around 55 degrees Fahrenheit, barely above the temperature at which roots become active. The soils are invariably acid.

These physical conditions of the soil, so unfavorable to forest growth in the swamps, may be remedied by the removal of excess water. It is not so much the actual water that causes the slow growth, but the fact that the water is stagnant, lacks oxygen, and therefore, prevents bacterial action in the soil.

Conclusions That May Be Drawn

From observations and experiments on the effect of drainage of swamps upon forest growth by the European forest experiment stations and our own Lake States Forest Experiment Station, the following conclusions may be drawn:

1. In swamp forests where the poor growth before drainage was due exclusively to excess water, drainage causes an immediate increase in growth in all trees in the swamp. Just as in the case of Norway spruce and pine in Europe, so in the case of our own black spruce in northern Minnesota the increase in diameter after removal of the excess water was from 2½ to 3 times under such conditions and the increase in height from 2 to 7 times, and the increase in volume from 12 to 23 times.

2. The increased growth through drainage is influenced in spruce, tamarack, and other conifers by the depth of their roots. The more superficial their roots, the greater is the increase in growth due to drainage. The deeper the roots go into the peat, the less is the effect of drainage upon growth. All other conditions being equal, the effect of drainage, therefore, is greater upon young trees than upon old trees, in stunted trees more than in well-developed trees, and in spruce more than in the pine. This rule has practically no exceptions, because after drainage the upper layer of the soil dries out first of all, and the more superficial roots in this layer get first the benefit of the removal of the excess water. The roots which lie deeper in the soil are relieved of the excess water only much later, slower, and more feebly, and at times do not feel the benefit of the drainage at all, if the ditches are not sufficiently deep or if the roots have reached already the mineral sub-soil. Young trees, stunted trees, and poorly developed trees in general have more superficial roots than older or better developed trees. Drainage benefits, therefore, the trees of the poorer growth.

3. The drainage of swamps makes the top soil suitable for germination of tree seeds. Young growth, therefore, appears abundantly on such drained swamps. The best results, however, are attained when the moss from such peat swamps has been removed.

4. Drainage of swamps for forest purposes must not be extreme. On the contrary, it is necessary that drainage should be gradual, depending upon the success of the young growth.

A Profitable Forest Operation

That the drainage of spruce forests is not a theory but is considered a profitable forest operation may be judged by the extent to which it is being practiced in Scandinavian countries. In Finland some 800,000 acres of such swamp lands have been drained to improve the forest growth. In Sweden the Forest Service, between 1875 and 1920, has spent $326,000 for such ameliorative works on the state forests and is at present expending annually some $116,000 for this purpose. In addition the Forest Owners' Association of Sweden, a private organization, during the decade 1911-1920, drained, on an average, some 36,000 acres per year, or during the first ten years, a total of over 360,000 acres. A similar record can be shown for northern Russia and Norway.

One or two examples from Sweden of the profitableness of draining swamp forests may be mentioned. A sedge bog which had no timber growth, was drained 23 years ago and is now covered with splendid fully stocked stands of young mixed forests from natural seeding in after drainage. The stands have a volume of 570 cubic feet (7 cords) per acre and the annual growth has already reached 49 cubic feet (a little over half a cord). This undoubtedly will be doubled within a few years.

On one area of mixed pine forest about 60 years of age located on very swampy land, at the time it was drained in 1915, the growth was at the rate of 41.4 cubic feet per acre. Seven years later, after drainage, in 1922, the annual growth per acre reached 159 cubic feet, or an increase of 117.6 cubic feet per acre per year. The stumpage value of this timber in Sweden amounts to 5.3 cents per cubic foot. The increased growth per year of 117.6 cubic feet amounts annually to $6.23 per acre.

This almost exactly covers the cost of drainage, which amounted to $6.61 per acre. In other words the initial cost of drainage was equal to the increased growth in the seventh year after drainage.

Drainage Work in Sweden

I do not want to give the impression that all drainage under all circumstances can prove as profitable as this. Much drainage work has been carried out in Sweden for forest purposes where the increase in growth does not yet and never can carry the interest charges upon the capital invested. And there are still other cases where the drainage has failed completely in bringing about any increase in growth. These failures serve as a warning that much judgment is required in deciding what types of swamp land should be drained for forest purposes, but in no way challenge the importance of drainage work as one of the most effective methods of increasing forest production in swamps.

At the wages prevailing in Sweden, the rough average cost per acre is close to $6. In Russia before the war from $2 to $4 per acre. In our own country a few experiments of draining such swamp forests conducted by the Lake States Experiment Station

was carried out in one case where about 20 acres in extent was drained by means of dynamite at nearly $7 per acre. In another case, on the Minnesota National Forest, where the ditching was done by hand and the swamp was only 11 acres in extent, at a cost of $18 per acre. In the proposed drainage of a swamp about 180 acres in extent, which involves the digging of a long outlet, the estimated cost is about $14; also hand ditching.

Costs Not Too High

These costs are still too high. They were obtained in experimental work where the chief purpose was to study the effect of the lowering of the water level upon timber growth rather than to make a cost record. When the work develops on a large scale and is reduced to an efficient basis and the use of dynamite and machinery is developed, we ought to be able to lower Swedish figures. I hope it can be done at a cost of between $3 and $5 per acre. This initial cost should pay for itself within the first 5 or 7 years by increased growth. If, of the 5,000,000 acres of swamp forest, only 2,500,000 acres could be drained and the growth in them doubled, they would be equivalent to an increase of the spruce area by 2,500,000 acres, or 50 per cent. A much larger area undoubtedly lends itself to drainage and the growth should at least be trebled. I do not advocate for the owners of spruce swamp forests immediately rushing into the drainage of their swamp forests. There is still some further experimenting necessary, especially as to the cost and manner of ditching. But trials on a small scale would be fully justified as one of the most promising ways of prolonging our spruce supplies in the Lake States.

This drainage of swamp forests should not be confused with drainage of open muskegs for agricultural use. Such drainage in many localities proved a curse. It did not benefit agriculture, proved a burden upon the counties, and only increased the fire menace. The bone-dry drainage of the peat swamps has aggravated the fire situation in northern Minnesota. The drainage for improving timber growth does not mean bone-dry drainage, but only superficial drainage which involves the lowering of the water possibly one or two feet. This drainage does not place on the market any new agricultural land for which there is no demand, but immediately increases the supply of an eagerly sought commodity—spruce pulpwood.

Assume More Luxurious Growth

Such drained swamp forests assume a more luxurious growth, a much denser natural reproduction, and, therefore, offer a much more effective cover for wild game. It harmonizes with the tendency of a time to preserve the forests not merely for the timber supply, but also for their effect on wild life. It is, therefore, a conservation measure in every respect. Whatever will benefit spruce will also benefit balsam fir, which is generally associated with spruce. The measures, however, should be directed toward increasing spruce stands and not balsam on account of the spruce budworm. It is the opinion of the forest insect experts that it is the presence of balsam fir in the spruce stands that accounts largely for the spruce budworm assuming an epidemic character.

If the spruce supplies can be prolonged only another 20 years above their estimated life, spruce plantations established now would mature just in time to provide a supplementary source of spruce pulpwood in 40 years. If the growth in our existing spruce forests could be increased by proper management to 1/3 of a cord, the 5,000,000 acres of spruce forests could yield over 1,500,000 cords of pulpwood a year, or nearly 2¼ times the present consumption of spruce in the entire region.

Hemlock Doomed to Disappear

The other most important pulpwood species in the region—hemlock—lends itself to forest management with comparative simplicity and ease. There is a general feeling throughout the region that hemlock is doomed to disappear as a result of the present cuttings. The lumbermen, because of the competition with Douglas fir and white fir from the Pacific Coast, find it difficult to log and manufacture it into lumber at a profit. Although much of the hemlock is still being cut for lumber, hemlock finds an increasingly larger market for pulpwood. Hemlock seldom grows in pure stands. It always occurs in mixture with the northern hardwoods such as hard maple, beech, yellow birch, elm, and basswood. It is a tree that thrives best, at least in its early stages, under the shade of the hardwoods. When the lumbermen cut the hardwoods clean and the slashings catch fire, as they invariably do, sooner or later, the hemlock reproduction is doomed. The larger trees, if they are left by themselves after the hardwoods are cut away, even if the ground is not burned over, deteriorate and die away. The shallow roots accustomed to moisture can not stand the drying out of the soil and the tops of the trees suddenly exposed to direct sun light to which they are not accustomed, also suffer and die. Moreover, hemlock is easily overthrown by wind when left by itself. The bulk of the hemlock pulpwood supply comes from the hardwood land owned by the lumbermen. The cutting of those hardwoods is not controlled by a demand and supply for hemlock pulpwood, but by the demand for hardwood lumber. The hemlock is cut at the same time as the hardwood timber is cut, because if it is left uncut, it is a total loss. It happens very often that more hemlock is cut than the pulp mills can absorb, with the result that the price for hemlock pulpwood is depressed.

There are years when the pulp mills can buy hemlock logs for pulpwood almost below the cost of production. The prices for hemlock pulpwood, therefore, are often a bone of contention between the lumbermen and the pulp men. One of these days, however, the lumbermen are going to turn the tables on the pulp men and the foresters are deliberately helping them in this attempt because in the long run the change will prove beneficial to the pulp men themselves.

Reproduction of Hemlock Easy

Reproduction of hemlock is the easiest silvicultural operation there is, provided the hardwoods are not cut clean. If the hardwoods are cut partially or selectively, hemlock, far from being doomed, will spread more aggressively than any other species. The lumbermen begin to realize that cutting of the small merchantable trees which because of the higher cost of logging them and the small amount of high grade lumber obtained from them, is not a profitable business. They turn more and more to the so-called "selective logging" in which only the largest trees yielding the highest grade of lumber, are taken out. If selective logging becomes a general practice, as it is likely to become in the course of the next ten years, the hemlock need not be cut at the time the hardwoods are cut. It can remain with perfect safety in the woods until such time as the market conditions justify its logging. This will do away with the occasional glutting of the hemlock pulpwood market and stiffen the prices, but at the same time will insure the perpetuation of the hemlock. Under the shade of the remaining hardwoods, hemlock will continue to reproduce itself and grow to pulpwood sizes. It is certainly a method of cutting that recommends itself to the pulpwood manufacturers who own their own timberlands. Several timberland owners have adopted selective logging as a general practice.

Selective Logging the Solution

Selective logging in mixed stands of hardwoods and hemlocks is the solution of the future supply of hemlock. With a large supply of hemlock still on hand, if this method is applied to all of our hardwood forests in which hemlock occurs, there is no need to worry about the future of the hemlock supply in the Lake States.

The perpetuation of hemlock is not the only advantage of selective logging. Hemlock reproduction is merely a by-product. The chief advantages of selective logging are the removal from one-half to three-quarters of the value of the stand in the form of high grade logs and leaving three-quarters of the stand growing, the elimination of the slash disposal problem, and leaving the cut-over forest in a fairly fire proof condition.

The future supply of jack pine pulpwood in the Lake States need not give any concern if ordinary common sense is used in handling the jack pine forests. There are some 8,000,000 acres

of jack pine forest in the whole region. By states it is distributed roughly as follows: Michigan, 2,000,000; Wisconsin, 3,200,000; Minnesota, 2,800,000; total, 8,000,000.

This includes all kinds of stands ranging from open to dense, and from very young growth to mature stands. It is confined largely to sandy soils on which the competition from other species except red pine is very small. Jack pine can maintain itself even if cut clean, by simple silvicultural measures,—fire protection in the young and maturing stands and preferably controlled light burning of the cut-over land. With complete fire protection of both the growing stands and the cut-over land the tendency would be toward replacement of jack pine in the future by other conifers, particularly red pine, and in some localities by spruce, balsam fir, and white pine. The growth even today without forest management over the entire area must be close to 1¼ million cords per year. Jack pine stands under management and on the better soils can produce a cord of wood per acre per year and become merchantable at the age of 35 or 40 years. Under very simple management it could be increased to 4,000,000 cords a year—an amount greater than the pulpwood industry can absorb for many years to come.

21,000,000 Acres of Aspen

There are, roughly, some 21,000,000 acres of popple or aspen varying again from open to dense, and from mere reproduction to mature stands. Probably not more than one-fifth of that area or about 4,000,000 acres is now of merchantable size. The most abundant supply of aspen is in Minnesota, with Wisconsin next, and Michigan third. Here again there is no source of worry for the future supply for many years to come. The large area covered by aspen is the direct result of clear cutting and burning red and white pine stands, and also the northern hardwoods. Simple measures, such as complete fire protection, whether cut clean or partially, should maintain the pulpwood supply indefinitely. About 15 per cent of all the aspen stands, if protected from fire, will gradually revert to red and white pine or spruce and balsam fir stands. Over 85 per cent of the aspen area, however, unless artificially underplanted with spruce and white pine, will maintain itself indefinitely as aspen.

Well-stocked stands of aspen produce about ¾ of a cord per acre per year. If the entire area is put under forest management, a production of ½ a cord per acre per year may be expected. This, for the entire area, would make possible an annual cut of some 10,500,000 cords.

Much of the jack pine and popple are in small private holdings of settlers. There should be, therefore, an open market for a great deal of both popple and jack pine pulpwood for many years to come.

The dead tamarack which has been killed about 10 years ago by the larch sawfly, and which is being used to some extent for pulpwood, is rapidly deteriorating and will soon cease to be a factor in the pulpwood market.

Situation Not Discouraging

The pulpwood situation, then, in the Lake States, even with the shortage of spruce in the not distant future, is not by any means hopeless or totally discouraging.

Prophecies have a habit of not turning out exactly as they are made. Prophecies of disaster seldom turn out to be thoroughly bad, and optimistic prophecies seldom turn out to be as rosy as they were pictured. Most troublesome problems have a way of adjusting themselves in the course of time. I am not looking, therefore, for any radical changes in the pulp and paper industry provided opportunism does not become the keynote in the solution of the problem. Not too much hope should be placed on securing raw material from Canada, Scandinavia, or even our own Pacific Coast; not too much implicit faith should be given to the revolutionary changes in the chemical processes of pulp and paper making, but earnest efforts put forth in solving the pulpwood supplies in the region itself.

The pulp and paper industry in the region is strategically located with regard to centers of consumption and markets. There is no need of moving the industry to other regions. If only half of the attention and thought is given to the problem of providing raw material that is given to the technical processes of manufacturing, the industry could maintain itself indefinitely and even provide for considerable expansion. There must be a different attitude on the part of the industry toward the raw materials than existed heretofore. The forest must cease to be treated merely as a mine but looked upon as a renewable resource, possible of improvement.

Will This Pay?

A natural question comes to mind: will this pay? Whether it will pay to individual pulp and paper men, no one can tell except those intimately familiar with the financial status of each individual enterprise. For the industry as a whole, there is not the slightest doubt but that it will pay. The best managed forests in Scandinavia are those owned by men in the pulp and paper industry. It is an economic axiom that industries dependent upon forest raw materials can best afford economically the practice of forestry. With such industries the choice lies not so much in whether they can make a profit in growing timber or not, but between having an abundant dependable supply of raw materials at reasonable prices and no supply at all or irregular supply at high prices. Some pulp and paper mills, even today, figure that if they can be assured of raw materials at the actual cost of producing them without any profits, they would have the advantages over those mills which have to depend on securing their supplies in the open market. They count on obtaining their profits in the manufacturing end.

There is a great deal of misconception of the cost of forest practice. For some reason the timberland owners consider the reforestation of their cut-over areas as an entirely separate financial operation from the rest of their timber business. They look upon reforestation as a separate investment for a long period which at the end must pay for all the carrying charges at compound interest and still leave a fair profit to the owner.

Based on Old Conceptions

This theory of forest finance is based on the old conception that the forest is a mine and the operation ends with the removal of the merchantable timber. With the removal of this timber, the asset itself is destroyed and the capital withdrawn.

If such a principle were applied to any other continuous business, it would lead within a short time to the elimination of the industry. Any industry to be perpetual must retain its assets intact, the profits being only the dividends on the capital invested. The permanent capital itself as it is withdrawn with the sale of the goods is reinvested in the business. For instance, a wholesale drygoods business which has a certain permanent capital, as it sells its goods, reinvests part of the proceeds in replacement of the stock. Out of the annual proceeds, in addition to replacement of the stock, are also paid the operating charges such as maintenance of buildings, insurance of stock, sales department, transportation, etc. If it becomes necessary to build a new warehouse, the interest on the capital invested in the warehouse and depreciation are paid out of the current business. The same is true if the business is financed by bonds; in such cases the interest on the bonds and the sinking fund for their redemption come in any sound business from the current revenue.

If the pulp and paper industry is to be converted from an industry which destroys its assets into an industry with a permanent invested capital, in growing timber, it must inevitably adopt the same principle. Timber growing as a permanent business must consider reforestation of the logged-off land as a part of its timber operations and as an absolute condition for continuous forest production.

Necessity for the Paper Industry

The maintenance of the cut-over land in a productive state and stocked with trees, ranging from the smallest to the largest, is as

much a necessity for the pulp and paper industry as for the wholesale drygoods merchant to keep on hand a full stock of his goods, or for a manufacturer of high grade, air-seasoned lumber to keep on hand stacks of lumber at different degrees of drying.

Forestry, no more than any other business, cannot be shown to be highly profitable if investments in reforestation of logged-off land are to be treated as a separate operation, computed at a high rate of compound interest, the proceeds from which at the end of the period must cover all the carrying charges in addition to a certain profit.

When Compound Interest Is Justifiable

Compound interest charges are justifiable only where a forest land owner, after having removed all the merchantable timber from his tract and is no longer a going concern as a timber producer, decides to invest in cut-over land. Under such conditions there is no annual income and the money put into reforestation must be considered purely as a long time investment. Such investments are, as a general rule, not attractive yet to private owners and can best be carried out by the Government, States, counties, municipalities, and other public agencies or by trust companies seeking safe long-time investments at a comparatively low rate of interest.

Timber Growing Profitable

Without attempting to show just how profitable timber growing may be to going timber concerns, an illustration is given here of the manner in which financial computations should be made to determine the possible profits under certain conditions.

An owner of a jack pine tract of, say, 40,000 acres wishes to devote his land continuously to growing jack pine. What are the elements of cost and the basis for figuring the possible returns from such an enterprise?

Jack Pine Production

Jack pine in 40 years, with only fire protection to the growing stands, will produce on an average about 20 cords per acre, including good, medium and poor soils. Let us assume that the owner logs every year 1,000 acres. In 40 years, he will, therefore, cut over the entire tract. At the end of the 40 years, the first 1,000 acres which he will have logged, say, this winter, if the land is given fire protection, will be ready to cut again, and the same will be true of every successive 1,000 acres logged.

The average stumpage price of jack pine, at present, is $1 a single cord. The returns from the 1,000 acres, if the average stand of the tract logged is 20 cords, would represent an annual gross income of $20,000 for stumpage alone, or on an acre basis, $20.

Cash Involved

The cost involved in producing continuously this gross income is protection of the entire 40,000 acres from fire, or for every acre cut, 40 acres must be protected from fire. Assuming 10 cents per acre as the cost of fire protection, the owner will have to spend every year, out of every $20 gross income per acre, $4 for protecting 40 acres from fire; for the 40,000 acres, $4,000. In addition, of course, there will be the annual taxes to pay on the entire tract out of the income for the 1,000 acres cut, or on 40 acres from the income from one acre cut. The taxes vary all the way from 10 cents to 35 cents per acre for cut-over land. Assuming 15 cents per acre as the usual annual tax on jack pine land, that would mean $6,000 on the entire tract, or $6 on 40 acres. There will be in addition the cost of slash disposal, amounting to 17½ cents per cord. This item is included in the logging cost, and, therefore, is not properly chargeable against timber growing. The value of jack pine land is at most $1 per acre, which must be considered as a permanent investment and only the annual interest of, say, 4 per cent must be charged against the annual gross income.

The total computation, then, is as follows:

JACK PINE UNDER CRUDE FORESTRY

Area.....40,000 acres of jack pine
Average stand.....20 cords per acre on the 1,000 acres cut annually

Annual income from 1,000 acres		Annual costs on 40,000 acres	
20,000 cords, at $1	$20,000	Fire protection, at 10 cents	$4,000
		Taxes, at 15 cents	6,000
		Interest on land, at $1.00 (4 per cent)	1,600
		Total annual costs	$11,600
Annual gross income per acre	$20	Annual cost per acre	$11.60

Returns—$20.00 annual income per acre
11.60 annual cost per acre

$ 8.40 net return per acre cut

Net returns from 1,000 acres cut annually—$8,400, or 21 cents per acre for the entire 40,000 acres.

The growth removed from one acre of mature timber represents the annual growth of one acre for 40 years or the growth of one year on 40 acres. By protecting from fire 40 acres, the owner secures the growth which he removes from one acre of mature timber. His assets, therefore, are not destroyed, but simply reinvested and the profit of 21 cents per acre merely represents the dividend upon the permanent capital invested in growing timber.

A Conservative Calculation

This calculation is very conservative as there has been no allowance for stumpage increase in jack pine, and the cost of fire protection is placed very high. Jack pine in some localities brings even today $2 per cord. Within ten years $2 will unquestionably be the average price, and in 40 years it should approach $4 per cord. The returns may be expected, therefore, to be at least double what they are now. On the other hand, with better fire protection provided by the State and better general slash disposal throughout the region, the cost of fire protection to the private owner should become less. This provides sufficient leeway to take care of occasional forest fires that may occur and damage from insects, fungi, or from other causes.

At least one pulp and paper company, in attempting to provide for a future supply of raw material, is following this method of financing. The company is using some 30,000 cords of pulpwood a year. It charges each cord of pulpwood obtained from its own lands or purchased in the open market with an additional $1 for the replacement of the wood capital or provision for future supplies. The fund of $30,000 forms the reforestation fund and is used for planting, fire protection, and purchases of young timber.

The fate of the industry is, therefore, largely in the hands of the pulp and paper men themselves. The pulp and paper mills, especially those which own their own forest lands, are confronted with the alternative of either handling their forest land as a renewable resource, providing a continuous and ample supply of pulpwood at a reasonable cost, removing the increasing difficulties and cost of obtaining raw materials, or allowing the land to become idle waste and exposing themselves to the hazard of seeking raw materials in distant markets in competition with other wood-using industries.

Which will they choose?

BEVERIDGE PAPER CO. EXPANDS

Construction has begun of a two-story addition to a one-story building of the Beveridge Paper Company plant at 717 West Washington street, Indianapolis, Ind., which will add 50,000 square feet of floor space, reports Marshall D. Lupton, secretary.

The first story building was completed several years ago. The addition will extend over a greater area than the supporting building and part of the construction will be three-story.

The job will be completed by June 1, according to present plans, and work in the plant under expansion will not be interrupted. When completed, the structure will house machinery for the manufacture of a special, high-grade paper. A 10,000-pound power elevator and shower baths for employees will be set up. The addition cost has not been announced.

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CAPACITY 500 TONS DAILY

Use of Statistics for Budget Purposes

Presented by Paul S. Hanway, Statistician, American Paper & Pulp Association, Before the Cost Association of the Paper Industry, at the Waldorf-Astoria Hotel, New York

The business budget is a comparatively modern innovation, although budgets have been prepared by Governments for controlling public expenditures for many years. Unfortunately the business budget cannot be said to be in general use, although those concerns which have adopted the budget system, are among the most progressive in the country.

The budget is a statement prepared from estimates for a definite future period, of the expected operations in each department of a business. The forecast for each department is dependent upon the anticipated activities of all other departments, as for example,—a manufacturing program must be based upon anticipated sales, and the estimate of sales must be limited naturally by the productive capacity of the mill. Estimates from all departments are combined to show a statement of cash receipts and expenditures, and estimated profit and loss statement and a balance sheet, as it will appear at the end of the budget period.

These three statements make up a tentative budget, which is submitted to the heads of the business for revision and approval, and it is for them to determine the volume of sales which in their judgment ought to shape the company's financial policy, for the forthcoming period. The entire budget must be based on the policy then decided on. Standards of performance are established for operating departments, while limits of expenditure are placed on others. Costs both for operating and extensions are carefully compiled and adjusted, until finally a budget is compiled, which is approved by the executive heads.

The Budget an Estimate

The budget, then, is an estimate. It may be an estimate based on the expenditure and income of previous years—an arbitrary mechanical allotment of funds requiring a correspondingly arbitrary sales quota to maintain it and permit its accomplishment, or it may be a budgeted estimate reached by combining experience and a careful analysis of business trends and anticipated changes affecting your business.

The first budget, you will see at a glance, can work consistently only so long at its corresponding sales quota is maintained. Any economic changes affecting the sales department throw a figurative monkey wrench into the carefully computed budget. If sales fall off in Cheyenne and are not increased in Kalamazoo the quota falls below its mark, and the budget is carrying an excess burden, a part of which must be considered as loss. The value of the budget then is lessened and the estimates must be readjusted.

The purchasing department may find in July that changing conditions make it impossible to obtain materials at a price consistent with the January estimates and again the budget is affected.

We will consider later others of the many items, that affect this type of budget and make it inadequate to the growing needs and changing demands of modern business..

The budget which combines with this purely mechanical proportioning of expenditures based upon past experience, a thorough survey of general business trends, a careful and interpretative analysis of economic conditions, the development and probable trends of allied and contributing lines of industry anticipates the change and assists in intelligently planning the budget to meet the demands that prove so dangerous and disrupting to the budget based merely upon records of the past.

Furnishes At Least a Working Basis

A budget estimated with these factors in mind, carefully analyzed and enterpreted to your requirements,—has at least a working basis which assured reasonable success and permanence. The make-up of such a budget allows your business to adjust itself to the economic changes during the year, both in general business, and to the specific industries which will affect the consumption of your products, and the cost of manufacturing these products. The purely mechanical estimate which is based entirely on past expenditures and so largely disregard the business variants, and their probable trends, may be expert enough in itself but too often short of fulfillment by reason of its inability to keep pace with general business.

The one is elastic, anticipating, sensitive to symptomatic indica-

OUTSIDE FACTORS REQUIRING STATISTICAL STUDY

tions, and adjusting itself to changing demands; the other is rigid,—arbitrary. It is inconvertible. It makes no allowances for the inclemency of the elements. There are storms in the business world. The weather forecast is important and the wise budget maker knows his weather vane.

The Problems Illustrated

This illustration will serve, I believe, to demonstrate clearly just what I have been describing to you.

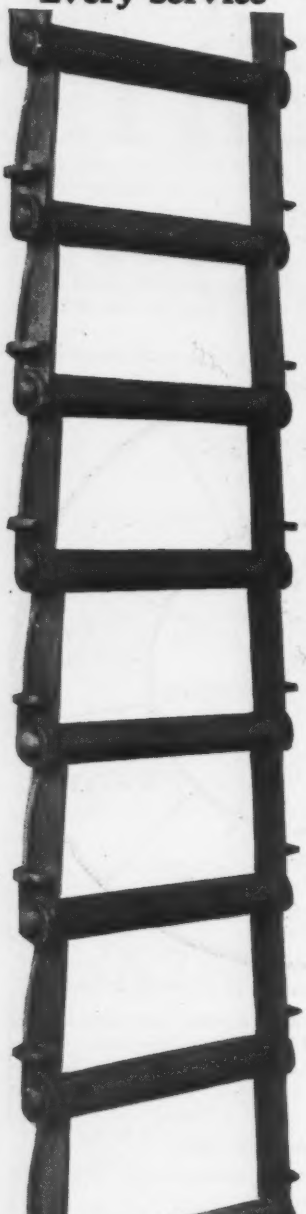
The inner circle represents your business,—or any business. Divided the business into five main divisions. We have then Management, Finance, Purchasing, Manufacture, and Distribution.

Over these inside divisions of your business ,you have absolute control. You can hire, fire, change grades, systems, etc., at will.

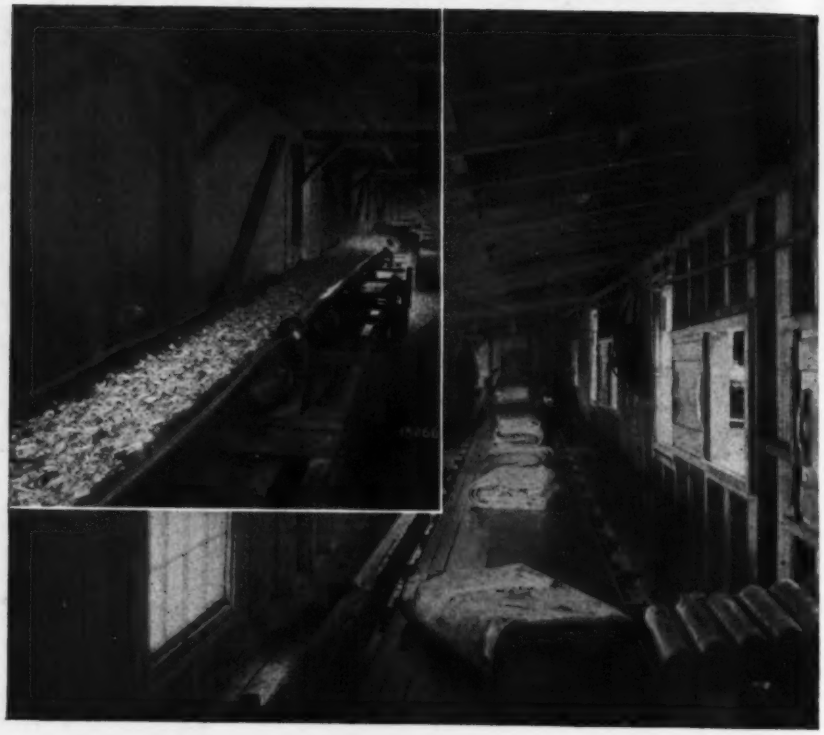
There is a financial department which prepares at regular intervals, or on demand a complete report on the condition of your business. In these you have before you a minutely detailed picture of your business, in so far as the divisions pictured here are concerned. And if the reports don't just suit you, they may be changed, and unless the figures lie,—your business remains at the same value, the report changes having no effect upon the business itself.

But do these various departments complete the picture of your business? Most certainly they do not.

Jeffrey Chains for Every Service



Jeffrey Reliance Drag Chains for Chip and Ash Conveyors.



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Locomotives
Coal Mine Equipment
Tipple Equipment
Ventilation Fans

Influences Constantly Operating

Outside of your business are influences over which you have no control whatever, but which are constantly operating and affect your success or failure.

1. One eighth of your income is eaten up by the Federal taxes you pay on your business. Here, then, is a factor over which you have no control. An outside element that must, however, be considered.

The Cost of Money

2. Another elemental varient is the cost of money. Money rates rise and fall normally with demand. A surplus of gold in the country makes possible an expansion of credit which occasionally, as at the present time, is greater than the needs of business, thus keeping money rates low in spite of increased demand. This cost of money enters into business from all angles. Low money rates, such as we have had during the past year, make it possible for business to relieve itself of some of the burden of cost. Bonds and other securities with heavy interest payments have been redeemed or refunded and new securitis with lower rates, issued, when necessary, in their stead. The accumulated totals of such redemptions for the country during the past year are staggering. These refunds have been running about one billion a year. Easy credit makes possible the financing of greater production. The partial payment plan has permitted a much larger consumption of goods of every description. It would be difficullt to estimate accurately the increased consumption of paper alone due to this existing credit situation, but undoubtedly it has been of great benefit to this as to all other business, and has been largely responsible for the great volumes of business of the past two years.

The trend of this fundamental factor—the cost of money—is one of exceeding importance to each and every one of you. Six is 50 per cent more than four. 6 per cent paid for the hire of money instead of 4 per cent means a 50 per cent difference in cost and must be considered in your budget making. If you finance your purchases or your stocks with borrowed money, the saving of interest may prove a large factor in your profit and should be an important consideration in your budget.

The Cost of Raw Materials

3. Possibly the most important of these elemental outside factors—the factor contributing most largely to the success or failure of your budget—and the factor whose storm signals and weather signs are most accurately read and whose interpretation is most necessary, is the cost of raw materials.

In order to buy your materials at the right turn of the market, to make possible the proper appropriation in your budget for the purchase of these materials,—the budget maker conferring with the purchasing department, must know the trends of production, consumption and stocks of the various basic raw materials to be purchased. Thus and thus only can be judged whether the price movement will be up or down. To do this he must be advised as to changing conditions in other industries.

For illustration: Three of the largest consummers of Rosin are —aper, Paints and Varnishes and Soap; of Sulphur—Paper,. Fertilizer and Chemicals; of Salt Cake,— Paper and Glass, etc.

It is readily seen that to obtain any accurate idea as to the future trends of consumption of any of these materials, the budget-maker must consider what we might term the "competing consumers"—their production output, their stocks and their business trends. Unless the trend of this competitive consumption is followed and anticipated, how can the price movement be forecasted with any degree of accuracy?

A case in point was the recent situation in which the linoleum manufacturers found themselves. Linoleum, as you know, is made on a ground of burlap. A few years ago the India crop, from which burlap is made, was below normal yield. The sugar crop in Cuba was very large—demanding large consumption of burlap sacks in which to pack the sugar. It was evident that the available jute and consequently the available burlap would not be sufficient for both the sugar packers and the makers of linoleum and other consumers. Those manufacturers with knowledge of the situation, anticipating higher prices for burlap, immediately increased their stocks of that material.

A year later the situation was reversed. The world's largest cotton crop and the resulting low prices brought about the manufacture of cotton substitutes for jute which in turn affected the price and consumption of burlap. We find here, three large crops having definite bearing on flooring material prices.

Cost of Transportation and Labor

4. The Costs of Transportation figure largely in your budget. Rail and water rates, trucking, mailing, etc., are all subject to changes which you cannot prevent, but which you must consider in the year's budget.

5. Labor costs are an important item. Let us consider some of the various effects. The prices of the raw materials you buy may be radically affected by labor costs in the woods—in the mines—or where not.

Right now you are watching one very interesting labor situation which very nicely illustrates this phase,—I refer to the bituminous coal situation and the prospective strike in the offing. You cannot control the situation but you must plan to meet it. Its effect will be registered in changing costs to practically every line of business.

You can see— as a matter of fact, we have all heard a lot of patter for many years about the inter-dependence of business—the necessity of co-ordination—the new slogan replacing the old "Competition is the life of trade." Now, Combination is the life of Trade.

Combination of factors controlling our business, interpretation of the results of these controlling influences on our business directly and their indirect action through their effects on business allied and contributing or competing with ours.

Cost of Advertising

6. The costs of advertising, you must consider. These costs are not centered in the fee you pay to the advertising concern, but are and must be figured in the ability of the advertising to reach fertile pastures and prove profitable rather than pure promotion or missionary expenditure.

Competition Costs

7. Competition costs are known to every business. These may be divided into three general classes.

Overproduction capacity—or inside competition is harmful and costly to every paper mill.

Foreign Competition and its costs are evident. It may be in casein, pulps, paper,—or the shutting-off of your foreign markets. Beforehand knowledge of these trends cannot be other than beneficial.

Changing methods enters into the competitive phase, since new machinery or new inventions, new uses, etc.,—all have a bearing on future business.

Cost of Changing Conditions

8. Perhaps even more than the cost of raw materials which we have mentioned as of primary importance, is the cost of changing conditions.

The cost of changing conditions is nicely illustrated in the hand to mouth methods of purchases now in force. Today the mills are obliged to carry the stocks since most purchases are for immediate consumption. More attention to trends of consumption is required to avoid the rumors we heard of excess inventories. The middleman is fast losing his position in the business world, and the old time storage houses are mostly out of business. But even more important in this item are the changes in economic conditions throughout the country. Your volumes of sales are dependent largely upon the ability of the consuming public to buy your goods. Purchasing ability of Ohio may decline 20 per cent and that of Pennsylvania may decrease 30 per cent.

Announcing

International Bleaching Corporation

(OF DELAWARE)

An organization which has acquired basically important patents and process rights in the principal industrial countries of the world.

These include the well known American patents on pulp bleaching issued to

Robert B. Wolf
Stebbins Engineering & Manufacturing Co.
Philip K. Fletcher
Pulp Bleaching Corporation
The Moore & White Company
A. F. Richter
Grellet Collins
A. D. Merrill
J. E. Heiskanen

The sole licensee and selling agent for the United States and Canada is

Pulp Bleaching Corporation

39 Cortlandt Street **New York City**

Distribution of population is important to know, but still more important is the distribution of income. This affects the results of advertising, sales, manufacture, etc., in many different ways.

Other Important Items

There are other important items such as substitutes, consolidations in and out of the paper industry, etc., but those already mentioned will serve to demonstrate the great necessity for, and the value of, a true picture of these outside factors affecting your business.

Nearly every business spends thousands of dollars annually in the computation and presentation of an accurate and detailed report on the financial and statistical affairs—why then should one hesitate to spend $100,000 to $200,000 more for the same sort of reports on the even more important external factors over which you can have no control, and so far, my talk has been confined to what ought to be accomplished and resulting affects rather than on how to accomplish or make up a statistical summary of future business.

The use of statistics for indicating the trend of business conditions is becoming more general and more satisfactory. The ups and downs of business prosperity are due to elemental influences and more attention is being given to symptomatic statistics published regularly in financial journals, trade publications, and business reports. Many executives now have statistical reports made for their own business giving comparisons with previous periods and external statistics for other industries and trades.

It is to these symptomatic and comparative statistics that we look for the information and suggestions that we need in our budgeting.

Available Statistics

A partial list of available statistics follows:—

A summary of statistics compiled weekly, monthly and yearly, analyses based upon the opinions of leading economists, bankers, trade government and special reports, gives a very comprehensive and suggestive picture of the influences acting upon our business.

Financial

Bank clearings or bank debits; loans and discounts for the larger cities; growth of savings for the United States, in banks, buildings and loan associations, life insurance, and the purchases of investment securities; trends of money, call and term rates; trends of the gold reserves; new financing.

Commercial

Trends of employment: Inventories; commodity prices; manufacturing activity; agriculture—income; transportation—car loadings; mining—production.

Trends of Specific Industries: Steel; building and construction; automotive; hides and leather; textiles; chain and mail order sales; oil production and consumption; public utilities—power consumption; advertising.

Bituminous Coal

Production and consumption.

Pig Iron

Production and consumption.

Purchasing Power Changes

Trends of income in various sections of the country showing the ability of the public to buy goods.

Speculation

Stocks and bonds.

Foreign Trade

Economic conditions abroad. These may be regrouped into the following classifications: 1—Production; 2—Distribution; 3—Consumption; 4—Financial; 5—General.

There are any number of nationally known economic and statistical services issuing reports on various phases of general business. It is because so few of these statistical and economic services bring these general statistics into focus on the particular needs of any single industry that the American Paper and Pulp Association has of late been publishing weekly for its members, a condensed summation of the most pertinent of the statistical and economic happenings in general business bearing on future consumption of paper and pulps.

Comparative Statistics Needed

Even these condensed summaries do not fully answer the needs of any individual company. There are required in addition certain comparative statistics on your own grades or grade of paper and pulps to show where you are and where you are going, and to determine the effect of general conditions on your business in order to plan your future. An analysis of the factors affecting your business, of the statistics pertinent to your needs and an intelligent application to your individual budget is not a deeply involved nor complicated matter. The benefit derived is out of all proportion to the cost—and it is primarily essential to the successful operation of your business, which therefore you should even more consistently and intelligently analyze and incorporate in the making of your budget and the plans for the future of your business.

PROVINCIAL MILLS HAVE GOOD YEAR

In connection with the annual report of the Provincial Paper Mills, Limited, Toronto, which have plants at Georgetown, Mille Roches, Thorold and Port Arthur, Ont., S. F. Duncan, treasurer of the company, stated that the new machine at Port Arthur was now in operation and is working well. The machine is 165 inches wide with a capacity of 50 to 60 tons a day. It will turn out superior half-tone news for the present, a large portion of which will be exported. The past year was the most satisfactory one in the affairs of the company, being, in fact the best year since 1920. The report for 1926 shows $611,491 available for common equivalent to 17.4 per cent, as against earnings of 13.35 per cent in 1925.

Manufacturing profits amounted to $1,218,105 and sundry revenue $6,275, making a total revenue of $1,224,480 as compared with $1,060,304 in 1925. Bond interest absorbed $81,589, depreciation $300,000, reserve for doubtful debts, $2,400 balance of bond discount $50,000 reserve for income tax payable in 1927, $60,000 and preferred dividends $119,000. After these deductions $611,491 remained. The regular 6 per cent. dividends were paid, with a bonus of 1 per cent, leaving a surplus to carry forward into profit and loss account of $366,491. This, with the balance of $936,220 brought forward made the total balance brought forward $1,302,711.

The balance sheet shows property and plant account at $8,236,527, compared with $7,009,519 at the end of 1925. Of this increase $1,060,407 was for Port Arthur extensions during 1926. The only items found on the liabilities side is a bank loan "for Port Arthur extension" of $40,000 and accounts payable for Port Arthur extensions of $145,709. Total assets stood at $10,866,881 an increase of $1,194,755. The company's net working capital showed a decrease of $156,935, most of which is accounted for by accounts payable for Port Arthur extension. Total net working capital was $1,423,173.

I. H. Weldon was re-elected president of the Princincial Paper Mills, T. A. Weldon, vice president, S. F. Duncan, treasurer, and W. S. Barber, secretary. All the officers reside in Toronto.

UNION BAG TO SHOW NET LOSS

The preliminary statement of the Union Bag and Paper Company for 1926 shows operating profit of $73,990, after taxes and charges, but before depreciation. Assuming depreciation at about the same rate as heretofore, the result would be a loss of $180,039 for the year. This compares with a net profit of $223,083 after all charges and taxes in 1925. Current assets on Dec. 31 were $4,563,714, and current liabilities of $1,600,823, compared with $4,549,222 and $1,722,902 respectively at the end of 1925.

LONG AGO

Sixty years ago we built
Our first paper machine.
Through the long procession
Of Paper Machinery development
Our Engineers have successfully
met
The Various problems pertaining to
the industry.
As time progressed the position
Of this company has been
strengthened
By consistent service to customers.

Ask Us.

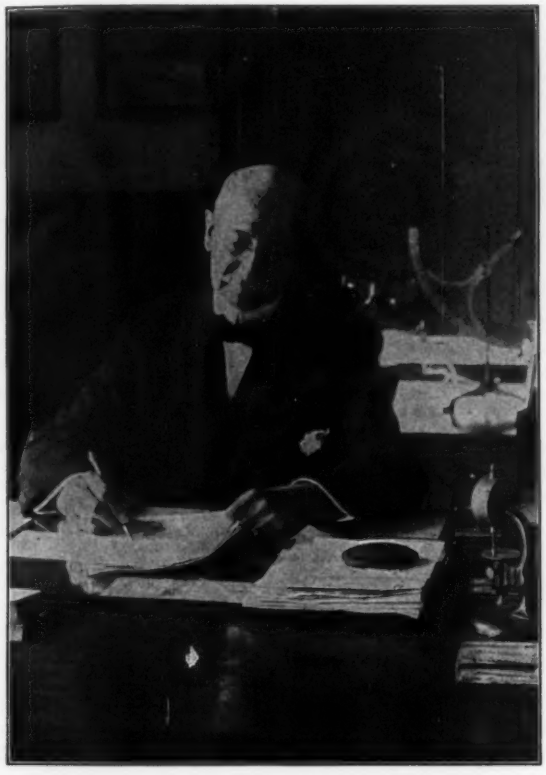
THE PUSEY AND JONES CORPORATION
WILMINGTON, DELAWARE

Obituary

Charles Henry Coye

Charles H. Coye, Secretary of C. H. Dexter & Sons, Inc., passed away Saturday, February 12, at his home in Windsor Locks, Conn., after a brief attack of heart trouble. He was in his 73rd. year and had been actively connected with the Dexter company for almost half a century.

Mr. Coye was an outstanding figure in the paper business, and anyone who ever came in contact with him never forgot his unfailing kindness and courtesy. Until comparatively recent years, he made friendly calls upon the paper houses in all the leading cities, and attended the various paper trade conventions, conferences and printing expositions. His circle of friends extended from coast to coast, and all will be most deeply grieved to learn of his death.



CHARLES HENRY COYE

Mr. Coye suffered an attack of angina pectoris, while at his dinner table. The doctors found upon examination that a heart block had formed which prevented any hope of recovery.

Charles Henry Coye was a son of Henry W. Coye and Hannah Coye, and was born at Monson, Mass., December 28, 1853. He went to Windsor Locks in 1878, where he entered the office of the Dexter grist mill. The following year he was transferred to the paper mill operated by the same company. His long term of service made him conversant with all the details connected with the manufacture and sale of paper. For many years he travelled as salesman for the company, making trips to every section of the country. On the road and in the mill he made friends quickly by his kindly personality, cheerful manner and never failing courtesy. When the company incorporated, Mr. Coye was made secretary in recognition of his long and loyal service to the Dexter interests.

Mr. Coye was a member of the Society of Mayflower descendants, the Sons of the American Revolution, and of the Chamber of Commerce, serving on the industrial committee of the latter. At the time of the World War he took deep interest in local war work. He was a member of the Congregational church and had been a deacon for many years. He leaves a widow, Anna P. Coye, and a sister-in-law, Miss Ella M. Hyde.

The funeral was from the Coye home, Tuesday, Feb. 15, the burial being in Grove cemetery.

UNION BAG MAKES NEW RECORD

Mill No. 5 of the Union Bag and Paper Corporation, recently established two new production records shattering records of more than fifteen years' standing. The mill resumed operations a few weeks ago after being closed down for nearly two months during which time the machinery was overhauled and altered in an effort to speed up production.

On February 9 it was announced through the office of General Superintendent George Witham, Jr., that the No. 5 Mill had produced the preceding day more paper than was ever produced in twenty-fours on any machine owned by the company in the last fifteen years. The No. 5 Mill usually produces about forty tons of paper a day. The new record is 63.9 tons and it is expected that this record will also be broken before long.

Last week it was announced by General Superintendent Witham that the weekly production record has also been broken by No. 5 mill with the production for the week around 240 tons. Remodeling of the paper machines and the installation of some new machinery including a high speed beater, is responsible for these records, company officials state. The firm has been carrying on considerable experimental work at No. 5 Mill in an effort to bring about greater production with consequent lower manufacturing costs and the results already obtained at this mill have greatly pleased company officials.

AN IMPORTANT PAPER DECISION

The recent decision of the United States Customs Court of Appeals denying importers of paper from Germany the right to deduct German inland freight from the dutiable value of the paper has resulted in the first of the formal decisions by the Customs Court following the ruling of the higher court. Scores of cases have been suspended awaiting the decision from the appellate court, and formal decisions in favor of the Government may be expected in these cases as rapidly as the pending cases appear on the docket.

The Import Committee of the American Paper Industry which has been representing the American manufacturers in this matter has received announcement of the first such decision in the matter of straw wrapping paper imported through New York.

A decision has also been handed down in a case originating at Cleveland in which it was held that cellulose wadding in rolls, 38 ply in thickness, was undervalued by the importer.

Importers have abandoned the following cases when they were called for trial: Writing paper imported at New York held by the appraiser to be subject to an additional 10 per cent duty for special finish; paper claimed by importer to be dryproof paper dutiable at ¼ cent per pound and 10 per cent, held by appraiser to be paper not specially provided for dutiable at 30 per cent.

JAPANESE PAPER INDUSTRY GROWS

The Japanese Paper Association reports production by mills of the association during November at 93,453,234 pounds and sales at 97,906,079 pounds, bringing the totals for the first eleven months of last year up to 951,953,631 pounds and 920,788,041 pounds respectively. Production and sales during the corresponding period in 1925 amounted to 851,230,185 pounds and 816,038,153 pounds. Consumption of paper base stocks by the association mills was somewhat heavier than during the corresponding month in 1925, the decrease in consumption or rags, waste paper, and chemical pulp being more than offset by the demand for straw and mechanical pulp.

PAPER TRADE JOURNAL
ESTABLISHED 1872
With Which Is Combined
PAPER
The Magazine of the Paper Industry
HENRY J. BERGER, Editor

Member A. B. C. Audit Bureau of Circulations

Vol. LXXXIV New York, February 24, 1927 No. 8

FIFTY YEARS OF USEFULNESS

The golden anniversary of the American Paper and Pulp Association, which the organization has been celebrating this week at its annual convention at the Waldorf-Astoria Hotel, New York, is an event of considerable significance. Through loyalty and good management on the part of its members, the Association has grown up with the industry and become one of the most representative and efficient trade organizations in the country, and is widely known and respected abroad as well.

Paper for the country's needs was altogether imported from Europe prior to 1690 when the project of erecting the first paper mill was begun in Philadelphia. The industry developed slowly until well into the 19th century when machinery began to be considerably used.

The introduction of the manufacture of ground wood in the United States, in 1867, furnished a decided impulse to the expansion of the industry and was of a special value to the country because of the wonderful forests of spruce specially suited to the manufacture of paper. Bankers became interested and made it possible to finance many large mills.

Trade and technical journalism developed with the industry during the past half century. The PAPER TRADE JOURNAL was published in 1872, six years before the American Paper and Pulp Association was founded. This, and other trade publications that were subsequently established have constantly furthered the interests of the Association. The late Howard Lockwood, founder of the PAPER TRADE JOURNAL, was one of the original members of the Association and one of its strongest supporters throughout his life.

The Association aims to facilitate the development of the paper and pulp industry, increase its efficiency, ameliorate industrial difficulties, further inventions and scientific research, as well as represent the industry in national and international questions. It does much more than that, however, as its splendid record shows. Its offices in New York City are excellently equipped for the work in which the organization is engaged. The annual meetings of the Association have always been outstanding events of every year since its inception far back in the 70's.

The technical papers presented at the meeting of the Technical Association of the Pulp and Paper Industry, which is an affiliated association of the American Paper and Pulp Association, and one of the most active associations of the parent organization, have been of decided benefit to the industry.

Paper has become a universal necessity; it is today used in every home for a multitude of services and American paper manufacturers have a world-wide market for many of their specialties. There appears to be no end to the use to which paper and pulp may be put, and this augurs well for the future greatness of the industry. The Association by its innumerable activities on behalf of the development of the industry, has largely contributed to the widening uses of paper.

The Association has likewise been of great national service in cooperating with the government in many cases when expert advice regarding the industry was needed and in representing the industry in international questions. It is difficult to appraise adequately the great value of these services and it is fortunate for the industry that it has such an organization always alert and ready to render efficient services whenever they are called for.

With this number of the PAPER TRADE JOURNAL there is issued an illustrated history of the American Paper and Pulp Association, writen by a competent historian, which covers the whole of the activities of the Association since its foundation. It may be seen from this work that no other euologies of the Association are necessary. Its present high standing is founded upon much hard work, faithfully and efficiently performed throughout the years. It was called upon to face many critical situations and problems which in every instance were successfully met.

The PAPER TRADE JOURNAL extends its sincere congratulations to the American Paper and Pulp Association on the happy occasion of its golden jubilee and wishes for it in the future a widely extended field of usefulness.

THE YEAR IN PAPER

The paper industry was unusually active during 1926 as may be seen from the interesting series of reviews by representative men in the various sections of the industry printed elsewhere in this issue of the PAPER TRADE JOURNAL. According to figures from a source generally recognized as authentic, production of paper in the United States during the year reached ten million tons and only 17 per cent of the paper making machinery was idle. So far as the factors of production and idle machinery are concerned, this beat the record of all previous years with the exception of the outstanding record of 1920 when only 14 per cent of the paper making machinery was idle during the year.

Consumption has absorbed the considerable increase in the production rather remarkably in most sections of the market and prices during the year on the whole have been steadier than during previous years. While competition generally has been more intelligent than in recent years, there have been instances in some sections of the industry which indicate that there is still considerable room for improvement in this respect. While profits have been fair, generally, it is felt in a number of lines that these have not been altogether adequate to the capital invested.

The most remarkable activity during the year was again apparent in the news print division of the industry. Canada, which because of the fact that its production is so largely consumed in the United States and is otherwise so closely connected with

the domestic industry, is usually considered with domestic production made the most surprising record and for the first time on the figures for the year definitely lead the entire world in the production of news print.

The increase in the production of news print in the Dominion in 1926 exceeded by 24 per cent the production of 1925 and exceeded the production of the United States by 195,000 tons. The output in the United States during the year was 10 per cent greater than in 1925 and the output of news print for the entire North American continent for the year totalled 3,768,000 tons and exceeded that of the previous year by 19 per cent, which marvelous record was made possible by the fact that mills during the year operated at 96 per cent of rated capacity. Consumption kept pace remarkably well with the increase in production, but, naturally, under the circumstances, there was no increase in prices, which, it is generally felt in the industry, should be higher.

The program for the immediate expansion of the news print industry of the Dominion is still under way. The great mill of the Canadian International Paper Company at Gatineau, Que., with its four 270-inch Fourdriniers, will be completed this year and the mill of the Kimberly-Clark Company for the *New York Times* at Spruce Falls, Ont., is under construction. Others of lesser importance are being built or seriously contemplated. This rapid expansion of the industry in Canada has caused some concern to be voiced as to its future, but with the decided increase of advertising in the newspapers and the constant expansion in the circulation of these newspapers,, it is hoped that the prospective increase in the production of news print will be naturally absorbed.

In book, cover and fine papers, the production for 1926 considerably exceeded that in 1925, but prices were not satisfactory as they should have been. Fewer machines, however, are contemplated for 1927 and under these circumstances, the market for these grades should show a continued improvement.

The wrapping division of the industry was less disturbed than in a number of years past. This is probably accounted for largely because of the fact that production and consumption were more nearly coincident than they have been during any years since the war. Conditions in this division of the industry point to continued improvement.

The production of paper board was heavier than last year. The industry experienced steadier and more efficient operation on the part of the mills which decreased cost of production; but inefficient merchandising, apparently, was responsible for some of the mills not profiting as they should have by this advantage. The Paper Board Association, formed a year or two ago, is however, doing considerable work in the way of educating its members to exercise greater intelligence in their methods of both manufacturing and selling and this work, it is believed cannot fail to have beneficial results.

The wood pulp market during the year was marked by a general stabilization which has been noticeably lacking for some years past. Production reached record breaking proportions, but supplies were absorbed in an orderly manner. Orders on contracts were placed earlier than usual in advance of requirements and prices continued without radical changes throughout the year.

While the year in the paper business has, as usual, had its ups and downs, it may on the whole be considered as having been fairly satisfactory. So far as the future can be judged at present, it may be said to be encouraging. Many improvements have taken place during the year; additional mills have been placed in operation and others will go into commission soon. This means increased competition, but there are indications that this is being met more sanely than even a short time ago, and if the improvement in this respect continues, as it seems likely to, 1927 should pass into history as another fairly satisfactory year at least.

SYMPOSIUM ON LIME

The Lime Symposium, to be held by the Industrial Section of the American Chemical Society at its spring meeting, April 11-16, in Richmond, Va., holds several papers of particular interest to the pulp and paper industry, as lime is an essential material in either the cooking medium or in the preparation of cooking liquors for pulp production by the sulphite, soda, or sulphate processes as well as in the cooking of straw and rags.

The use of lime in pulp production will be presented by P. A. Paulson, of the Kimberly-Clark Company. Mr. Paulson is well known for his work in the field of pulp and paper technology, particularly in connection with the sulphite process. He is the inventor of a milk-of-lime system for the manufacture of bisulphite liquor which is used by the Kimberly-Clark Company, and among other points of interest to the industry, will be a discussion of the problems connected with the use of both milk-of-lime and limestone systems in the production of sulphite pulp.

The papers and discussions will not be limited to the sulphite field, however, as problems connected with the use of lime in the sulphate and soda processes will be considered under the topic of causticization which is to be presented by W. D. Mount, an authority in that field.

Other papers of specific interest to the industry will be those on bleach production by A. H. Hooker, of the Hooker Electrochemical Company; Water Treatment, by C. P. Hoover, Columbus, Ohio, City Water Purification Plant; the Treatment of Trade Wastes, by L. F. Warrick, of the Wisconsin State Board of Health; Lime Hydration by F. W. Adams, of the Massachusetts Institute of Technology, and Whitewashes for use under high temperature conditions be E. P. Arthur, of the Ohio State University.

J. R. Withrow, head of the Department of Chemical Engineering, Ohio State University, is in charge of the preparation for the symposium, and will preside at the sessions.

TRUSTEE FOR PYNETREE PAPER CO.

James N. McCaw of Macon, Ga., was named trustee of the Fynetree Paper Company, bankrupt, of Gordon, Ga., at the first meeting of creditors.

Mr. McCaw stated that it would take $200,000 to renew operations of the plant and he indicated that this would be impossible.

When the bankruptcy petition was filed the liabilities of the concern were placed at $2,481,589.86 with assets totaling $2,114,-351.64. Machinery was valued at $1,500,000.

The Thomson & Norris Company of New York was the largest creditor.

Mr. McCaw was formerly prominently connected with the Proctor & Gamble Company of Cincinnati and Macon.

SWEDISH PULP SOLD AHEAD FOR 1927

With the gradual freezing of the north Swedish ports, the value of woodpulp sales has been decreasing, says a report to the Department of Commerce. The 1926 output of mechanical groundwood, and about two-thirds of the 1927 output has been disposed of. Prices remained firm to the end of the year.

The VOITH-WARREN GRINDER

AMERICAN VOITH CONTACT COMPANY, Inc.

280 Madison Ave. **New York City**

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Fort Kent, Me.—The International Paper Company, 100 East 42nd street, New York, is reported to be considering the erection of a new paper mill in the vicinity of Fort Kent, where a tract of land has been selected. The plant will be used for the production of news print and is reported to cost in excess of $1,000,000. The project will include the construction of a hydroelectric generating plant on the Fish River, at Fish River Falls. Application has been made, it is understood, to proceed with the construction of a power dam for the new station.

Watervliet, Mich.—The Watervliet Paper Company has made substantial progress with its expansion and improvement program, under way for several months past, and is said to be arranging for enlarged output at an early date. The total investment will approximate $750,000.

Newark, N. J.—The Mono Service Company, 381-89 Oraton street, manufacturer of paper containers, has superstructure in progress on a new three-story addition, 113 x 140 feet, and purposes to have the structure ready for equipment installation at an early date. It will provide more than 40,000 square feet of additional manufacturing area. The expansion will cost in excess of $100,000. J. B. Thompson is president.

Buffalo, N. Y.—The Beaverboard Companies, Inc., Beaver Road, manufacturer of wall board products, is said to have tentative plans under way for the construction of an addition to its Canadian branch plant at Thorold, Ont., to include new buildings and machinery to cost in excess of $100,000. The capacity will be considerably increased.

Batavia, N. Y.—The E. N. Rowell Company, Jefferson avenue, manufacturer of paper containers, has taken bids on general contract for the erection of its proposed new factory addition, to be three-story, 45 x 50 feet, estimated to cost approximately $40,000. Additional equipment will be installed for increased output, list of which will be arranged at an early date. It is understood that work on the structure will begin in March. F. Homelius, First National Bank Building, Batavia, is architect. E. N. Rowell is president.

Los Angeles, Cal.—The Pacific Coast Sales Book Company, manufacturer of office paper stock, etc., has plans under way for the erection of a new plant at the corner of Slauson avenue and Avalon boulevard. It will be one-story, 150 x 270 feet, reported to cost about $75,000, including equipment. John M. Cooper, Rives-Strong Building, Los Angeles, is architect, and will ask bids on general contract at an early date.

Richmond, Va.—The Wortendyke Manufacturing Company, Foot of 13th street, manufacturer of paper products, is arranging for immediate increased capacity at its local plant, in the line of gummed paper goods, following the recent purchase of the factory and business of the Peters Company, Brooklyn, N. Y., and removal of equipment from that plant to the Richmond works.

Clewiston, Fla.—B. G. Dahlberg, vice-president of the Clewiston Company, and president of the Celotex Company, 645 North Michigan boulevard, Chicago, Ill., manufacturer of insulating board products, is proceeding with a local land development project, and in connection with this work, a mill for the last noted organization is reported to be under contemplation. The project is in a preliminary stage, and will not mature for a number of months.

Brooklyn, N. Y.—The Gray Envelope Manufacturing Company, 83 33rd street, has leased additional space at the Bush Terminal, South Brooklyn, for increased operating and storage facilities.

Tonawanda, N. Y.—In connection with the organization of Remington-Rand, Inc., to take over and consolidate the Remington Typewriter Company, New York; the Rand Kardex Company, Tonawanda, manufacturer of filing stocks and systems; and the Baker Vawter Looseleaf Ledger Company, Benton Harbor, Mich., the new organization will proceed with expansion plans and will carry out, it is understood, the project of the Rand Kardex Company, recently announced, at Niagara Falls, Ont., including the construction of a new addition to present plant in the Bender Hill district, reported to cost close to $150,000, with equipment.

Philadelphia, Pa.—The Stanley Paper Stock Company, 210 Bainbridge street, has acquired a four-story building at 418-20 South Front street, and will use for expansion.

Brockton, Mass.—The Packard Carton Company, manufacturer of paper containers, has acquired the local "Ideal" plant of the Warner Box Company, manufacturer of kindred products, and will use the mill for increased output. It is reported that improvements will be made, including equipment installation. The Warner Company has also disposed of its plant at Newburyport, Mass., to I. W. Tapley and associates, and it is understood that the purchasers will arrange for continuance of operation in the line of paper carton and box production; a company will be organized, it is said, to carry out the plans. Leon B. Warner, president of the Warner Box Company, will continue operations at his Keene, N. H., plant.

Mistassini, Que.—The Lake St. John Paper and Power Company, Toronto, Ont., is arranging to develop its paper mill project at Mistassini, Que., so as to have the plant ready for an production in about 12 months. The mill will be equipped for an initial output of close to 200 tons per day, and is reported to cost more than $1,000,000. In connection with this work, the company will carry out a hydroelectric power development with capacity of about 21,000 hp.

Cochrane, Ont.—The Abitibi Power and Paper Company, Iroquois Falls, is reported to be arranging to ask bids at once on general contract for its proposed new newsprint mill on local site, to be equipped for a capacity of close to 200 tons per day. Contracts will be let so as to begin work, it is said, within 60 days.

New Companies, Etc.

New York, N. Y.—The Bee-Gee Paper Box Company, has been incorporated with capital of $10,000, to manufacture and deal in paper boxes and containers. The incorporators are B.

Baker Manufacturing Corporation

Manufacturers of

A General Line

Pulp and Paper Making Machinery

Automatic Magazine Grinders — Pocket Grinders — Ramsey Grinder Valves

Feeney Stock Regulators — Felt Conditioners — Jordan Intake Regulators

Wet Machines and Decker Machines — Worm Type Knotters, Bull Screens and Washers

Vertical and Horizontal Centrifugal Screens

Diaphragm Screens for Either Flat or Inclined Setting

Horizontal Rotary Paper Machine Screens — Centrifugal Pumps in Iron, Bronze or Hard Lead

C. Bache-Wiig Barking Drums for Four Feet Wood — Pulp Kneaders

Pulp Refiners, Either Single or Twin Type — Bronze Valves Pipe and Fittings for Sulphite Process

Hard Lead Valves Pipe and Fittings for Sulphite Process

Steel and Semi-Steel Valves for Soda and Sulphate Process

Winders, Winder Shafts, Reels, Etc., Etc.

BAKER MANUFACTURING CORPORATION

SARATOGA SPRINGS, N. Y.

Zernoske, R. Rubin and I. Halpert. The company is represented by Jacob Weinberger, 5 Beekman street, New York.

Rock City Falls, N. Y.—The Kaydeross Paper Company has been organized with capital of $500,000, and 1,000 shares of stock, no par value, to manufacture paper products. The incorporators are S. M. Moffatt, V. Gardiner, and D. C. Jones, Jr. The company is represented by Moffat & Jones, 341 Madison avenue, New York.

Chicago, Ill.—The Paper Novelty Manufacturing Company, 2942 Herndon street, has been incorporated with capital of $5,000, to manufacture paper goods. The company is arranging for an immediate change of name to The Huntinghouse Company, and will continue in the line of manufacture noted. The incorporators are S. L. and R. C. Horne.

New York, N. Y.—The Centaur Paper Mills Supply Corporation has been incorporated with capital of 100 shares of stock, no par value, to manufacture and deal in paper mill supplies and equipment. The incorporators are T. Pritchard and H. Tobias. The company is represented by A. S. Frasier, 248 Mulberry street, New York.

New York, N. Y.—The Green-Kaplan Paper Box Corporation has been incorporated with capital of $20,000, to manufacture paper boxes and containers. The incorporators are M. Green and R. Kaplan. The company is represented by Joseph Lew, 299 Broadway, New York.

Troy, N. Y.—Simpson & Moorehead, Inc., has been incorporated with capital of $100,000, to manufacture paper boxes and containers. The incorporators are F. A. and J. Moorehead and C. Hart. Representative: M. Disenbergh, Troy, attorney.

METROPOLITAN JOBBERS' MEETS

The Metropolitan Bag & Paper Jobbers' Association held its regular monthly meeting on February 10, 1927, at the Hotel St. George, Brooklyn, New York, which marked the end of ten years of its existence.

Next month, on March 10, the association will celebrate by a gala banquet, its tenth anniversary. This banquet will be held in the Grand Ball Room of the Hotel St. George, Brooklyn, and an outstanding occasion is looked forward to.

At the meeting held on February 10, at which almost the entire membership turned out in a body, it was called to the attention of the members that the resolution of the association passed at its meeting on January 13 whereby the Association declared itself in favor of the elimination of the manufacture and sale of flat bags in the metropolitan market, will go into effect shortly.

To prevent any of the jobbers from speculating on this item, a resolution was unanimously adopted by the Association that none of the members of the Metropolitan Association will stock up on flat bags, but will eliminate them entirely from their inventory as soon as possible.

The cooperation of the manufacturers will be asked towards the accomplishment of this end.

The entertainment committee in charge of the tenth annual banquet is as follows: George W. Batz, Chairman; Nelson Berger, Thomas J. Magle, Samuel Fishman, Philip Karlsruher, Fred W. Hinrichs, A. E. Masodam Jr., President-ex-officio.

NEW WAXED PAPER FACTORY AT BENSON

C. E. Goetz will start a new waxed paper factory at Benson, Ariz., about the latter part of this month. All the machinery for the plant has arrived and a new concrete building for the company's occupancy is being erected.

The company will produce waxed liners and wrappers for the various industries of the State. Through the Arizona Industrial Congress, Mr. Goetz is in touch with lettuce and cantaloupe shippers of the Salt River valley who use great quantities of waxed paper.

LOG DRIVE TO BE SMALL

The annual log drive will start April 1 it was announced following the yearly meeting of the Adirondack Log Drive and Boom Association held Thursday at the offices of Finch, Pruyn & Co., at Glens Falls, N. Y. This year's drive will consist of 60,000 old logs and a small quantity of new ones placed in the river by the Union Bag and Paper Corporation. Because of lack of water the drive last year was carried only to Blue Lodge above North River and 60,000 logs from the 1925 cut were not delivered. These logs will form the bulk of the drive this spring when they will be carried to destination. Starting April 1 the drive will continue for two weeks.

At the meeting Thursday committees were appointed to handle the drive as follows: Hudson River Drive Association—John Donahue, of North River, representing Finch, Pruyn & Co., William O'Brien, of Utica, the International Paper Company, Edward Brooks, of Indian Lake, the Union Bag and Paper Corporation and W. E. Ramsdell, of Hudson Falls, the Griffin Lumber Company.

The Hudson River Boom Association—F. B. Chapman, of Glens Falls, representing Finch, Pruyn & Co.; Thomas Remsen, of Hudson Falls, Union Bag and Paper Corporation; William O'Brien, International Paper Company and D. S. Griffin, Griffin Lumber Company; Elmer E. Smith, of Glens Falls, secretary and treasurer of the Hudson River Drive Association, was elected to the same offices in the Boom Association. E. J. Simmons, of Glens Falls, was named assistant secretary and treasurer of the Boom Association.

The Sacandaga Boom Company, Inc., also selected officers Thursday as follows: George N. Ostrander, of Finch, Pruyn & Co., president; William O'Brien, of Utica, representing International Paper Company, vice president, and Ray F. Fowne, of New York City, also representing the International Paper Company, secretary and treasurer.

Mr. Smith, of the I. P. Company, was also elected secretary and treasurer of the Schroon River Drive Association. No committee was named by this association, however, as the Schroon River organization has not operated for the last few years.

The number of logs to be brought down in this year's drive is extremely small compared with the hundreds of thousands of logs which made up the annual drive a few years back. Because of the large number of logs from the 1925 cut which failed to come through last spring owing to low water little cutting was done in the woods during the winter by the pulp and paper firms interested. The Union Bag and Paper Corporation's cut of pulp wood which will be included in the April drive is not as large as in former years.

OSWEGO PAPER CO. BUYS WATER POWER

After negotiations that have extended over a considerable period the Oswego Falls Pulp and Paper Corporation, of this city, has purchased the valuable water power rights of the American Woolen Mills on the Oswego River. The purchase is regarded as one of the most important business transactions in the history of the city. The transfer papers give ten dollars as the financial consideration but it is known that the actual amount involved in the deal totals several hundred thousand dollars. The Guaranty Title and Trust Company, of New York City, is reported as financing the purchase.

The acquisition by the Oswego Falls Pulp and Paper Company, of the water power rights of the American Woolen Mills gives the former concern control of one of the most valuable power sites in Northern New York. While it is understood the Oswego Falls Company will develop the power the firm's plans are not fully known. The American Woolen Mills have operated a plant here for many years making woolen fabrics and using water power from the river.

GEORGE R. WALLACE, Pres. & Treas.
GEORGE R. WALLACE, Jr., V.-Pres. & Mill Mgr.
FREDERICK WALLACE, Asst. Treas.

Fitchburg Paper Company

FITCHBURG, MASS.

De Luxe English Finish Papers
For Web, Flat Bed and
Rotogravure Printing

Special Papers for Coating and
Wall Paper Manufacturers

CAPACITY 35,000 TONS PER YEAR

Imports of Paper and Paper Stock

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING FEBRUARY 19, 1927

SUMMARY

Cigarette paper .....502 cs.
Wall paper .....55 pkgs., 100 bls., 33 cs.
Paper hangings .....12 bls., 13 cs.
Painted paper .....23 cs.
News print .....61 rolls
Printing paper .....19 rolls, 50 cs.
Wrapping paper .....8 rolls, 8 bls., 22 cs.
Packing paper .....20 pkgs., 31 bls.
Cover paper .....8 cs.
Pergamyn paper .....34 cs.
Trunk paper .....4 cs.
Colored paper .....6 cs.
Writing paper .....23 cs.
Silk paper .....2 cs.
Filter paper .....9 cs.
Gold coated paper .....10 cs.
Baryta coated paper .....46 cs.
Surface coated paper .....53 cs.
Drawing paper .....29 cs.
Decalcomania paper .....12 cs.
Transfer paper .....26 cs.
Paper boxes .....40 cs.
Envelopes .....28 cs.
Straw board .....1,165 rolls
Miscellaneous paper ....68 rolls, 65 pkgs., 233 cs.

CIGARETTE PAPER

P. J. Schweitzer, Pres. Polk, Marseilles, 101 cs.
Standard Products Corp., De Grasse, Havre, 161 cs.
Standard Products Corp., Indep. Hall, Havre, 40 cs.
R. J. Reynolds Tobacco Co., Indep. Hall, Havre, 200 cs.

WALL PAPER

W. H. S. Lloyd & Co., Caronia, Liverpool, 4 cs.
F. J. Emmerich, Caronia, Liverpool, 1 ble.
R. F. Downing & Co., Minnekahda, London, 4 cs., 12 bls.
A. C. Dodman, Jr., Inc., Mauretania, Southampton, 4 bls., 8 cs.
Keller-Dorian Paper Co., Mauretania, Southampton, 11 cs.
W. H. S. Lloyd & Co., American Banker, London, 55 pkgs.
F. A. Binder, Berlin, Bremen, 18 bls.
F. J. Emmerich Westphalia, Hamburg, 16 bls.
Globe Shipping Co., Westphalia, Hamburg, 23 bls.
J. E. Bernard & Co., Maasdam, Rotterdam, 26 bls., 6 cs.

PAPER HANGINGS

A. C. Dodman, Jr., Inc., Caronia, Liverpool, 2 bls.
A. C. Dodman, Jr., Inc., Regina, Liverpool, 1 cs., 10 bls.
Whiting & Patterson Co., Inc., Mauretania, Southampton, 12 cs.

PAINTED PAPER

Hensel, Bruckman & Lorbacher, De Grasse, Havre, 23 cs.

NEWS PRINT

F. Henjes, Jr., Westphalia, Hamburg, 61 rolls.

PRINTING PAPER

Keuffel & Esser Co., Westphalia, Hamburg, 19 rolls.
J. H. Scott Paper Co., Westphalia, Hamburg, 45 cs.
P. Puttman, Missouri, Antwerp, 5 cs.

WRAPPING PAPER

Perkins, Goodwin & Co., Noordam, Rotterdam, 6 cs.
C. Steiner, Westphalia, Hamburg, 9 cs., 8 bls.
F. C. Strype, Missouri, Antwerp, 8 rolls, 7 cs.

PACKING PAPER

Rohner, Gehrig & Co., Westphalia, Hamburg, 20 pkgs.
International Forwarding Co., Westphalia, Hamburg, 31 bls.

COVER PAPER

International Forwarding Co., Westphalia, Hamburg, 8 cs.

PERGAMYN PAPER

F. C. Strype, Westphalia, Hamburg, 33 cs.
E. V. Hadley Paper Co., Westphalia, Hamburg, 1 cs.

TRUNK PAPER

P. H. Petry & Co., Westphalia, Hamburg, 4 cs.

COLORED PAPER

E. Daiber & Co., West Mead, Antwerp, 6 cs.

WRITING PAPER

Hoole Service Co., De Grasse, Havre, 4 cs.
Judson Freight Forwarding Co., De Grasse, Havre, 3 cs.
Gallagher & Ascher, Minnekahda, London, 9 cs.
F. L. Kramer & Co., Minnekahda, London, 2 cs.
H. Reeve Angel & Co., Inc., Minnekahda, London, 1 cs.
Japan Paper Co., France, Havre, 2 cs.
Guibout freres, France, Havre, 2 cs.

SILK PAPER

S. Gilbert, Noordam, Rotterdam, 2 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., Minnekahda, London, 9 cs.

GOLD COATED PAPER

F. Murray Hill, Berlin, Bremen, 10 cs.

BARYTA COATED PAPER

Globe Shipping Co., Berlin, Bremen, 46 cs.

SURFACE COATED PAPER

L. deJonge & Co., Westphalia, Hamburg, 20 cs.
Whiting & Patterson Co., Westphalia, Hamburg, 11 cs.
Gevaert Co. of America, Missouri, Antwerp, 22 cs.

DRAWING PAPER

Keuffel & Esser Co., Westphalia, Hamburg, 20 cs.
P. Puttman, Missouri, Antwerp, 9 cs.

DECALCOMANIA PAPER

Phoenix Shipping Co., Berlin, Bremen, 4 cs.
C. W. Sellers, Westphalia, Hamburg, 2 cs.
L. A. Consmiller, Westphalia, Hamburg, 6 cs.

TRANSFER PAPER

F. L. Kramer & Co., Berlin, Bremen, 26 cs.

PAPER BOXES

Phoenix Shipping Co., Westphalia, Hamburg, 40 cs.

ENVELOPES

Globe Shipping Co., Berlin, Bremen, 28 cs.

STRAW BOARD

Grand Corrugated Paper Co., Noordam, Rotterdam, 102 rolls.
A. Vuyk, Noordam, Rotterdam, 507 rolls.
Perkins, Goodwin & Co., Noordam, Rotterdam, 556 rolls.

MISCELLANEOUS PAPER

National City Bank, De Grasse, Havre, 65 pkgs.
Japan Paper Co., De Grasse, Havre, 9 cs.
The Surbrug Co., De Grasse, Havre, 15 cs.
Canson & Montgolfier, De Grasse, Havre, 33 cs.
National Consumers Paper Corp., Ambridge, Rotterdam, 5 cs.
Winsor Newton, Inc., Minnekahda, London, 2 cs.
F. C. Strype, Westphalia, Hamburg, 29 cs.
Maurice O'Meara Co., Westphalia, Hamburg, 127 cs.
Watch Tower Bible & Tract Society, Westphalia, Hamburg, 68 rolls.
Keller-Dorian Paper Co., France, Havre, 3 cs.
The Eleto Co., France, Havre, 7 cs.
Hensel, Bruckman & Lorbacher, France, Havre, 3 cs.

RAGS, BAGGINGS, ETC.

American Exchange Irving Trust Co., Suevier Antwerp, 37 bls. rags.
E. Butterworth & Co., Inc., Noordam, Rotterdam, 72 bls. bagging.
E. J. Keller Co., Inc., Noordam, Rotterdam, 45 bls. rags.
Castle & Overton, Inc., Noordam, Rotterdam, 29 bls. rags.
P. Berlowitz, Noordam, Rotterdam, 131 bls. rags.
G. M. Graves Co., Inc., London Mariner, London, 55 bls. rags.
E. J. Keller Co., Inc., Ambridge, Rotterdam, 276 bls. rags.
B. D. Kaplan, Caronia, Liverpool, 23 bls. rags.
Darmstadt, Scott & Courtney, Minnekahda, London, 33 bls. rags.
Robert Blank, Westphalia, Hamburg, 43 bls. rags.
American Woolstock Corp., Westphalia, Hamburg, 187 bls. rags.
E. J. Keller Co., Inc., Tomalva, Antwerp, 19 bls. rags.
P. Berlowitz, Tomalva, Antwerp, 22 bls. rags.
Mutnik Bros., Tomalva, Antwerp, 22 bls. rags.
Whaling Waste Products Corp., Tomalva, Antwerp, 73 bls. jute card waste.
P. Berlowitz, Indep. Hall, Havre, 188 bls. rags.
Chemical National Bank, Indep. Hall, Havre, 198 bls. rags.
Salomon Bros. & Co., Indep. Hall, Dunkirk, 55 bls. thread waste.
Castle & Overton, Inc., West Mead, Antwerp, 135 bls. rags.

OLD ROPE

Brown Bros. & Co., Noordam, Rotterdam, 48 coils, 61 bls.
S. Birkenstein & Son, Noordam, Rotterdam, 45 coils.

MANILA ROPE YARN

Manufacturers Trust Co., Pres. Polk, Manila, 160 pkgs.

MANILA ROPE

Burrshel Co., Inc., Caronia, Liverpool, 10 pkgs.
Ellermans' Wilson Line, Minnekahda, London, 10 coils.
New York Cordage Co., Missouri, Antwerp, 58 coils.

SUNN ROPE

New York Cordage Co., Missouri, Antwerp, 27 coils.

CASEIN

National City Bank, Vestris, Buenos Aires, 522 bags.
National City Bank, American Legion, Buenos Aires, 834 bags.
Kalbfleisch Corp., American Legion, Buenos Aires, 1,063 bags.
Provincial Papermills (Toronto), American Legion, Buenos Aires, 417 bags.
D. C. Andrews & Co., Westphalia, Hamburg, 121 bags.

WOOD FLOUR

A. Kramer & Co., Inc., Noordam, Rotterdam, 300 bags.

WOOD PULP

H. F. Chalfont, Clakamas, Mulgrave, 1,289 cords wood pulp.
Bulkley, Dunton & Co., Ambridge, ——, 800 bls. wood pulp, 159 tons.
Castle & Overton, Inc., Berlin, Bremen, 1,027 bls. wood pulp.
Chase National Bank, Berlin, Bremen, 323 bls. wood pulp.
Irving Bank Columbia Trust Co., Berlin, Bremen, 200 bls. wood pulp.
Atterbury Bros., Inc., Berlin, Bremen, 500 bls. wood pulp.
M. Gottesman & Co., Inc., Hjelmaren, Halmstad, 2,500 bls. wood pulp.
E. M. Sergeant & Co., Hjelmaren, Gothenburg, 1,020 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING FEBRUARY 19, 1927

D. I. Murphy, Sydland, Marseilles, 296 bls. rags.
E. J. Keller Co., Inc., Sydland, Barcelona, 70 bls. rags.
Philadelphia Girard National Bank, London Mariner, London, 169 bls. rags.
2nd National Bank of Boston, London Mariner, London, 147 bls. rags.
Chase National Bank, London Mariner, London, 65 bls. rags.
Drexel & Co., London Mariner, London, 1 cs. writing paper.
Bulkley, Dunton & Co., Ambridge, ——, 11 bls. rags.
E. J. Keller Co., Inc., Ambridge, Rotterdam, 370 bls. rags.
Union National Bank, Ambridge, Rotterdam, 80 bls. rags.
Castle & Overton, Inc., Ambridge, Rotterdam, 265 bls. rags.

(Continued on page 303)

THE WATERBURY TOOL COMPANY

WATERBURY, CONNECTICUT

U. S. A.

Manufacturers of

HYDRAULIC VARIABLE SPEED DRIVES

for Paper Mill Machinery

FOLLOWING IS A LIST OF RECENT PAPER MILL INSTALLATIONS:—

	A. P. W. Paper Co.	Albany, New York	1 Second Press Drive.
	Babbitt-Kelley Co.	Bellows Falls, Vt.	1 96" Fourdrinier Paper Machine Drive
	Brown Company	Berlin, N. H.	2 Tube Machine Drives.
	Brown Company	Berlin, N. H.	1 152" Pulp Cutter Drive.
	Crocker-McElwain Co.	Holyoke, Mass.	1 102" Drier Drive.
*	C. H. Dexter & Sons	Windsor Locks, Conn.	1 96" Fourdrinier Paper Machine Drive.
**	Eastman Kodak Co.	Rochester, N. Y.	1 11-Section Machine Drive.
	Eastman Kodak Co.	Rochester, N. Y.	3 Special Machine Drives.
	E. B. Eddy Co.	Hull, Quebec	1 100" Fourdrinier Paper Machine Drive.
	Robert W. Gair Co.	Montville, Conn.	1 120" Rewinder & Slitter Drive.
	Robert W. Gair Co.	Piermont, N. Y.	1 120" Rewinder & Slitter Drive.
	Hollingsworth & Vose Co.	East Walpole, Mass.	1 110" 6 Cyl. Paper Machine Drive.
	Hollingsworth & Vose Co.	West Groton, Mass.	1 86" 4 Cyl. Paper Machine Drive.
	Keith Paper Co.	Turners Falls, Mass.	1 6-Section 36" Fourdrinier Paper Machine Drive.
	Keith Paper Co.	Turners Falls, Mass.	1 Special Drive.
	Kieckhefer Container Co.	Delair, N. J.	1 122" Rewinder & Slitter Drive.
	Mars Paper Corp.	Westfield, Mass.	1 72" Fourdrinier Paper Machine Drive.
	Millers Falls Paper Co.	Millers Falls, Mass.	1 90" Fourdrinier Paper Machine Drive.
***	Parsons Paper Co.	Holyoke, Mass.	3 Paper Machine Drives; 1 84", 1 85" and 1 86" Fourdrinier.
	Parsons Paper Co.	Holyoke, Mass.	1 Paper Cutter Drive.
	Rolland Paper Co.	Mont-Rolland, Quebec	1 100" Fourdrinier Paper Machine Drive
	Strathmore Paper Co.	Woronoco, Mass.	2 Special Calender Drives
	Strathmore Paper Co.	Woronoco, Mass.	1 Paper Cutter Drive.
	Strathmore Paper Co.	Mittineague, Mass.	1 2-Section 86" Fourdrinier Paper Machine Drive.
	Strathmore Paper Co.	Mittineague, Mass.	1 Special Calender Drive.
	Geo. W. Wheelwright Paper Co.	Hardwick, Mass.	1 86" Fourdrinier Machine Drive.
	Geo. W. Wheelwright Paper Co.	North Leominster, Mass.	1 114" 4 Cyl. Paper Machine Drive.
****	Whiting Paper Co.	Holyoke, Mass.	2 Paper Machine Drives; 1 62" Fourdrinier and 1 66" Fourdrinier.
	Worthy Paper Co.	Mittineague, Mass.	1 66" Fourdrinier Paper Machine Drive.

* Three Additional Paper Machine Drives on order (2 72" and 1 96" Fourdrinier). When the installation of these three drives is completed, the mill will have all its paper machines equipped with the Universal Hydraulic Variable Speed Drive.

** These are not paper machines, but method of oper ation and control being precisely the same as in paper mill operation, they are included in this list. One additional drive on order.

*** All Paper Machines in this mill are equipped with Universal Hydraulic Variable Speed Drive.

**** One Additional 86" Fourdrinier Paper Machine Drive and one Paper Cutter Drive on order.

Paper Manufacturers Interested May Inquire of Any of These Users As to Results Obtained from These Installations

Old Paper Machines Readily Equipped With This Modern Drive With Slight Interruption in Operation

Imports of Paper and Paper Stock

(Continued from page 301)

D. I. Murphy, Ambridge, Rotterdam, 394 bls. rags.
S. E. Ingber, Ambridge, Rotterdam, 86 bls. rags.
Franklin Paper Co., Tomalva, Antwerp, 27 bls. paper waste.
Chicago Woolstock Co., Tomalva, Antwerp, 19 bls. rags.
D. I. Murphy, Tomalva, Antwerp, 309 bls. rags.
M. Friedman, Tomalva, Antwerp, 112 bls. rags.
A. S. Datz & Son, Tomalva, Antwerp, 2 cs. wrapping paper.
Stephano Bros., Indep. Hall, Havre, 20 cs. cigarette paper.
Strawbridge & Clothier, Indep. Hall, Havre, 1 cs. writing paper.
D. I. Murphy, Indep. Hall, Havre, 51 bls. rags.
P. Berlowitz, Indep. Hall, Havre, 185 bls. rags.
J. H. Whitwell, Indep. Hall, Havre, 1 cs. painted paper.
J. M. Hagy Waste Works, Indep. Hall, Dunkirk, 354 bls. rags.
D. I. Murphy, Indep. Hall, Dunkirk, 55 bls. rags.
E. J. Keller Co., Inc., Indep. Hall, Dunkirk, 178 bls. rags.
D. I. Murphy, West Mead, Antwerp, 387 bls. rags.
Equitable Trust Co., West Mead, Antwerp, 191 bls. rags.
M. Friedman, West Mead, Antwerp, 230 bls. rags.
E. J. Keller Co., Inc., West Mead, Antwerp, 48 bls. bagging.
MacBlaine & Co., West Mead, Antwerp, 61 bls. rags.
Quaker City Paper Co., Hjelmaren, Gothenburg, 209 bls., 231 rolls paper.
Paper Manufacturers Co., Inc., Hjelmaren, Gothenburg, 39 bls., 1,148 rolls paper.
Paper Manufacturers Co., Inc., Hjelmaren, Gothenburg, 54 bls., 1,865 rolls wrapping paper.

BOSTON IMPORTS

WEEK ENDING FEBRUARY 19, 1927

Brown Bros. & Co., Caronia, Liverpool, 28 bls. rags.
G. F. Malcolm & Co., Caronia, Liverpool, 12 cs. tissue paper.
American Express Co., Caronia, Liverpool, 4 bls. rags.
Bank of Commerce, Caronia, Liverpool, 13 bls. rags.
Bulkley, Dunton & Co., Stadsdyk, ——, 136 bls. wood pulp.
Bulkley, Dunton & Co., Stadsdyk, ——, 65 bls. rags.
Bulkley, Dunton & Co., Seattle Spirit, ——, 101 bls. rags.
Bulkley, Dunton & Co., Bird City, ——, 483 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING FEBRUARY 19, 1927

Atterbury Bros., Inc., Hjelmaren, Kotka, 1,500 bls. wood pulp.
Atterbury Bros., Inc., Hjelmaren, Halmstad, 1,500 bls. wood pulp.
Bulkley, Dunton & Co., Hjelmaren, ——, 250 bls. wood pulp.

BOSTON PAPER MARKET STEADY

Boston paper merchants report a continuance of steadiness in the market for all lines. Dealers in ledgers and bonds state that there is an average good business with a decided improvement over the activity of a year ago. Prospects appear favorable for kraft paper. The box board market is firm, with the mills at least fairly busy. New business has been on the increase, particularly in the last two weeks. At the first of the year board buyers had covered for requirements up to February 15, but they have been coming into the market and paying the advanced prices. Box board merchants look for a fairly steady market at an even price for the next two months or more.

In paper stock, the market has been more or less quiet, although the opinion still prevails that price changes generally will tend upward. Rags are apparently firmer in general without being higher. A sizable amount of fine writing paper stock was sold during the week. Evidently the purchaser does not believe prices will decline further. Some, however, are taking losses in sales. One well-known house has had a large quantity of new light prints on hand since October, bought at 6 cents, which the concern is now selling at 4 cents. A paper stock concern bought 100 tons of Egyptian rags during the latter part of the week which the sellers feel ought to bring 2¼ cents. Claims for rejections, largely for moisture, are a difficulty confronting the paper stock trade at the present time. Buyers make a charge of a quarter of a cent for extra sorting.

CHICAGO PAPER MARKET

A Chicago market, otherwise steady and quiet, only provides news concerning the approaching convention in New York. Business that has been taking an exceptionally optimistic tone is reflected in the many plans of paper men for attending the coming meeting of the association. Certain minor difficulties were almost completely overcome and relegated to past history that permitted most of the executives of paper houses to plan their trips without any worries.

The recent price cutting of an Eastern house seems to have been finally taken care of here with only one or two changes in prices. The only unanimous change seems to be in No. 2 Enamel, where a lowering of a cent or two was noted. A persistent rumor that Canadian manufactured news print was being lowered in price by a few concerns was discounted before the end of the week. Some few firms reported that they understood Canadian news print mills, hungry for business, had dropped prices to get more volume. This report seems strange in view of the fact that news print has been so strong at all times. The news was without foundation and accounted for when big paper houses dealing in news print affirmed that 90 per cent of the news print made in the United States and Canada had been contracted for until December 31, and that it would be impossible for any definite price reductions to take place outside of a very few "pirate" reductions.

MUTUAL BENEFIT ELECTION

Reorganization of the Mutual Benefit Association of the Kimberly-Clark Company and the Neenah Paper Company of Neenah, Wis., took place at a meeting of the governing board on Thursday of this week. The result is the withdrawal of the Neenah Paper Company from the organization to operate under a plan of its own, and the addition of the Kotex Manufacturing Company, Inc., employees as participants in the benefits.

S. F. Shattuck was reelected chairman of the governing board, Lawrence Eisenach is secretary, and Willard Peerenboom, assistant secretary. Representatives have been named to the board from each mill of the Kimberly-Clark Company, Neenah, Wis., the Kimberly-Clark Company, Inc., Niagara Falls, N. Y., and the Kotex Manufacturing Company, Inc., and all its branches.

In place of the $500 life insurance formerly offered by the association, each employee now may take a policy for $1,000 under a group insurance contract with the Prudential Life Insurance Company. He pays $1.50 a month and receives all former benefits of the association in addition to the life insurance. An allowance of $1.40 per day is given in cases of sickness, and a scale of compensation given in accident cases.

The Neenah Paper Company and its 216 members have elected to withdraw on March 1. Each employee is to be given a life insurance policy of $500 gratis, and adequate coverage for illness or accidents.

HARDY S. FERGUSON

Consulting Engineer

MEMBER AM. SOC. C. E.
" AM. SOC. M. E.
" ENG. INST., CAN.

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New York Market Review

Office of THE PAPER TRADE JOURNAL,
Wednesday, February 23, 1927

Normal conditions prevailed in the local market during the past week. The demand for the various grades of paper was mostly routine, but now that the spring campaign is beginning, greater activity may be anticipated from now on. Prices are holding up well in most sections of the paper trade, and there is little evidence of shading.

The news print market is exhibiting a strong undertone. While news print production during January in the United States declined to 135,755 tons from 140,030 tons in January last year, Canadian mills turned out 161,724 tons against 139,688 a year ago. The output is being readily absorbed by the publishers and stocks in hand are limited.

Demand for the various grades of paper board was fairly persistent during the past week. No radical price changes were reported. The fine paper market is exhibiting a strong tendency and a good volume of orders are being booked. The coarse paper market is also in an excellent position, and kraft wrapping paper is still in good request.

Mechanical Pulp

Conditions in the ground wood market are little changed. Supplies of both imported and domestic mechanical pulp are quite sufficient to take care of the prevailing demand, and quotations are exhibiting an easy tendency. No. 1 domestic mechanical pulp is now being offered at from $27 to $30, f.o.b. mill.

Chemical Pulp

Trading in the chemical pulp market during the past week was fairly active. Both the domestic and the imported grades are well sold ahead, according to the manufacturers, and quotations are steady and unchanged from the basis reported last week. A satisfactory volume of inquiries are being received for future business, and the outlook is promising.

Old Rope and Bagging

Demand for old rope is gradually improving, and prices on all grades are holding up very well. Dealers are looking forward to a more active buying movement ere long. Bagging is moving in moderate volume. Accumulations are reported to be limited, and the trend of the market is fairly steady.

Rags

Some improvement has been noticed in the domestic rag situation. An excellent amount of orders were said to have been booked during the past week, and prices are being well maintained, in most instances. The imported rag market is still rather quiet, but there are some signs of a revival of activity in the near future.

Waste Paper

Book paper and old kraft machine compressed bales are in better request. A better feeling is also developing for other grades of paper stock. The volume of inquiries in the market for future business is fairly satisfactory. Prices are generally being maintained at previously quoted levels.

Twine

While the twine market has been rather quiet of late, now that the spring trading season is approaching, a revival of business is due at any time. Demand for wrapping paper appears to be keeping up in a satisfactory manner, and prevailing conditions point to an excellent request for twine, for some little time, at least.

WANTS DUTY ON RAG PULP

Representative Brand, of Ohio, has introduced a bill in the House "to amend the Tariff Act of 1922 by transferring rag pulp from the free list to the dutiable list." The bill, which has been referred to the House Committee on Ways and Means, provides for a duty of 35 per cent and is as follows:

That paragraph 1651 of the Tariff Act of 1922 is amended to read as follows:

"PAR. 1651. Paper stock, crude, of every description, including all grasses, fibers, rags, waste, including jute, hemp and flax waste, shavings, clippings, old paper, rope ends, waste rope, and waste bagging, and all other waste not specially provided for, including old gunny cloth, and old gunny bags, used chiefly for paper making, and no longer suitable for bags."

SEC. 2. Paragraph 1313 of the Tariff Act of 1922 is amended to read as follows.

"PAR. 1313. Rag pulp; papers and paper board and pulpboard, including cardboard and leatherboard or compress leather, embossed, cut, die cut, or stamped into designs or shapes, such as initials, monograms, lace, borders, bands, strips, or other forms, or cut or shaped for boxes or other articles, plain or printed, but not lithographed, and not specially provided for; paper board and pulpboard, including cardboard and leatherboard or compressed leather, laminated, glazed, coated, lined, printed, decorated, or ornamented in any manner; press boards and press paper, all the foregoing, 30 per centum ad valorem; test or container boards of a bursting strength above sixty pounds per square inch by the Mullen or the Webb test, 20 per centum ad valorem; stereotype-matrix mat or board, 35 per centum ad valorem; wall pockets, composed wholly or in chief value of paper, papier-mâché or paper board, whether or not die cut, embossed, or printed lithographically, or otherwise; boxes, composed wholly or in chief value of paper, papier-mâché, or paper board, and not specially provided for; manufactures of paper, or of which paper is the component material of chief value, not specially provided for; all the foregoing, 35 per centum ad valorem."

SEC. 3. This Act shall take effect upon the day following its enactment.

SWEDISH PULP EXPORTS INCREASE

Exports of pulp and paper from Sweden to the United States during 1926, according to a report from American Consul de G. MacVitty, Stockholm, were valued at $38,152,358, an increase of 20 per cent over the preceding year and of 14 per cent over 1924. This rise, however, was wholly due to an increase in the value of wood pulp shipments, exports of paper during the years in question having fallen succesively from $6,481,860 to $5,265,503, and $3,863,740.

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MILLS AT LAWRENCE, MASSACHUSETTS

Enameled Book a Specialty

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PRINTING PAPERS
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Eric D. Lindberg, Secy.
Stephen C. Rosebush, Treas.

Mills at
Appleton and Kaukauna
Wisconsin

Miscellaneous Markets

Office of THE PAPER TRADE JOURNAL,
Wednesday, February 23, 1927.

Trading in the local chemical market during the past week continued along routine lines. Regular contract shipments are still moving in excellent volume. Spot sales, at present, appear to be limited to small purchases. Production is not in excess of the prevailing consumption, and surplus stocks are not accumulating to any great extent. Prices of most paper makers' chemicals are ruling steady, and schedules are being well maintained.

BLANC FIXE.—The blanc fixe market is in a sound condition and inquiries for future business are fairly numerous. Prices remain unchanged. The pulp is still selling at $60 per ton, in bulk, while the powder is offered at from 4 cents to 4¼ cents a pound, in barrels, at works.

BLEACHING POWDER.—Demand for bleaching powder is steady, and the market is exhibiting a strong undertone. Contract shipments continue to move at a satisfactory pace. Prices are holding up to schedule. Bleaching powder is quoted at from $2 to $2.40 per 100 pounds, in large drums, at works, according to quantity and grade.

CASEIN.—During the past week, trading in the casein market was rather light. Buyers appear to be holding off the market in the expectation of better prices. The quotation for imported casein ranges from 16 cents to 16½ cents per pound, while domestic casein is selling at from 15½ cents to 17 cents a pound, all in bags, car lot quantities.

CAUSTIC SODA.—Contract withdrawals of caustic soda have been well up to average. Consumption is large, and production is being well maintained, to cope with the demand. Caustic soda is still quoted at from $3 to $3.10 per 100 pounds, in large drums, at works. Spot car lots are offered at $3.20 per 100 pounds.

CHINA CLAY.—The china clay market remains practically unchanged. All grades were in fair demand during the past week. Prices were unaltered. Imported china clay is still quoted at from $15 to $25 a ton, in bulk, ship side. Domestic washed paper makers' clay is selling at from $8 to $9 a ton, at mine, and pulverized at $10 a ton.

CHLORINE.—Consumption of chlorine continues to increase steadily, and production is also proceeding in a satisfactory manner. Contract withdrawals are moving in good volume. Chlorine is selling at 4 cents a pound, in tanks, or multi-unit cars, at works, on contract orders. The spot price ranges from 4½ cents to 4¾ cents a pound.

ROSIN.—Purchasers of rosin are not displaying much confidence in the market just now, and the demand is light. Prices continue to fluctuate. At the naval stores, the grades of gum rosin used in the paper mills are now offered at from $11.85 to $12.50 per 280 pounds, ex dock, in barrels. Wood rosin is quoted at $10 per 280 pounds, in carload lots, at southern shipping points.

SALT CAKE.—Steadiness continues to prevail in the salt cake market. Shipments on contract are moving in good volume, and prices are holding up very well. Supplies are just about sufficient to meet the prevailing request. Salt cake is still quoted at from $18 to $20 a ton, in bulk, at works. Chrome salt cake is selling at from $14 to $15 a ton.

SODA ASH.—The soda ash market is in a strong position. Contract withdrawals are proceeding on a large scale, and consumption is very heavy. Plants are reported to be operating at full capacity. Contract quotations, in car lots, at works, per 100 pounds, are as follows: in bags, $1.32½, and in barrels, $1.57½.

STARCH.—Paper makers' starch continues in good demand, and consumption appears to be increasing. Large shipments are going forward steadily to consumers. Prices remain unchanged. Special paper makers' starch is still quoted at $3.22 per 100 pounds, in bags, and at $3.39 per 100 pounds, in barrels.

SULPHATE OF ALUMINA.—Conditions in the sulphate of alumina market are sound. Consumption is being well maintained, and the market is exhibiting a strong undertone. Quotations are steady to firm. Commercial grades of sulphate of alumina are offered at from $1.40 to $1.45, in bags, at works, in car lots. The iron free is quoted at from $2 to $2.05 per 100 pounds, at works.

SULPHUR.—Demand for sulphur was mostly along routine lines during the past week. Shipments against contract continue to move at a steady pace. The spot request has been rather light of late, but prices are well maintained. The quotation on the grades of sulphur used in the paper mills ranges from $18 to $19 a ton, in bulk, at mine.

TALC.—The volume of business transacted in the talc market during the week was satisfactory. Contract withdrawals continue to go forward steadily, and prices are generally holding up to schedule. American talc is quoted at from $16 to $18 a ton, at eastern mines, and at from $17 to $25 a ton, at western mines. French talc is still selling at from $18 to $22 a ton, ship side.

MOOSEHEAD PAPER CO. SOLD

The property of the Moosehead Paper Company at Skowhegan, Me., including land, mill, water right and power estimated at 401 horsepower, has been sold at tax collector's public sale to collect tax for 1926 of $2,340.98. Cylde H. Smith, first selectman of Skowhegan, bid in the property for the Town of Skowhegan for $2,361.57 for the whole property as assessed. There were no further bids.

The property was declared sold to the Town of Skowhegan for the amount of the tax assessed for 1926, with interest and cost added, amounting in all to $2,361.57. This is the property at the end of the Maine Central Railroad bridge in Skowhegan, which was formerly known as the Savage Pulp mill, being then owned by E. L. Savage of Skowhegan, now residing in Watertown, Mass., and his two brothers.

The Savage Manufacturing Company sold the property and it has since been known under two or more different names, one being the Skowhegan Paper Company, and the last, Moosehead Paper Company. The mill burned about two years ago and has not since been rebuilt. It was heavily insured for about $200,000 and a long drawn out hearing was held in Augusta a year ago to collect insurance, which was finally done. There are still taxes due the Town of Skowhegan for the two previous years' taxes, suits pending in Somersworth Supreme Judicial Court against the last two named companies.

DAVID EDWARDS PAPER CO. FORMED

The David Edwards Paper Company, 600 North Saginaw Street, Flint, Mich., has arranged to distribute all grades of coarse wrapping paper, paper bags, stationery, twines, matches, brooms etc.

The companny is a co-partnership, consisting of:—David Goldfarb, President, Flint Paint and Varnish Corporation, Flint, Mich. Edward Rosenberg, General Manager, New Orleans Fruit House, Flint, Mich. Sam N. Magidsohn, Assistant Manager, New Orleans Fruit House, Flint, Mich.

David Goldfarb will be the active head and manager of the company. He was formerly in the paper business in Watertown, N. Y., having founded the Watertown Supply Company with Charles Walroth, and selling out to the present owner, Lew Mooney.

Mr. Goldfarb announces that the business was started with $20,000 in cash, which has been deposited with the Citizen's Commercial and Savings Bank of Flint, and that the company has up to $150,000 which can be used in the business if necessary.

PAPER INDEX NUMBER LOWER

The January wholesale index number for paper and pulp was 154.8 compared with 157.6 in December, 181.5 in January of last year taking 1913 at 100 per cent according to the Department of Commerce.

WALDRON

"Case" Enclosed Short-Line Dryer

showing double tier of enclosed mechanical festoons carrying goods and providing sectional control of drying to any degree desired.

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That's a Real Test!

MAKE IT RIGHT IN YOUR OWN BEATER!

Let us send you a regular, standard 12½ lb. bag of Paris, so you can make a REAL test yourself!

Try the Paris soaking idea—the simple method which makes a paste of the industry's "Blackest Black" so that it may be handled as easily and quickly as a wet clay.

Paris, "The Blackest Black at the Lowest Cost," is guaranteed to economize the production and enhance the quality of your paper stocks.

Send for your sample of Paris.
No obligation.

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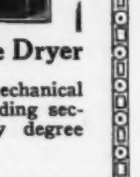

INFINITE care in the selection of paper, speeding deliveries when speed is essential and selling only at right prices is only part of the service to those we serve.

It is the going beyond the mere selling of merchandise that really counts, because service without friendship would be partial.

It is the friendship and sentiment in business relationships that make us anxious to serve and make service a pleasure.

BERMINGHAM & PROSSER CO. KALAMAZOO CHICAGO NEW YORK PAPER

BERMINGHAM & PROSSER

Kalamazoo, Michigan

160 N. LaSalle St.,
Chicago, Illinois

105 W. 40th St.,
New York, N. Y.

Market Quotations

Quoted by Hepburn & Co., 74 Broadway, N. Y. City, to whom all inquiry for quotations on these or any other Securities is referred.

BONDS	BID	OFFERED
Advance Bag & Paper, 7s 1943	101	103*
A. P. W. Pulp & Power, 7s 1945	102	106*
American Writing Paper, 6s 1947	79	82
Bastrap Pulp & Paper, 6½ 1940	98	101*
Bedford Pulp & Paper, 6½ 1942	97	100*
British Columbia Pulp & Paper, 6s 1950	80	90*
Beaver Products Corp., 7½s 1942	106	109
Bedford Pulp & Paper, 6½s 1942	95	100
Berkshire Hills Paper, 8s 1941	60	80
Brown Paper Co., 1st 5½s 1946	94	98
Bryant Paper Co., 6s 1942	98	102
Cape Breton Pulp & Paper, 6s 1932	101	103
Central Paper Serial 6, 6½s 1942	89	...
Champion Coated Paper, 6s 1926 to 1932	98	...
Champion Fibre, 8s 1930	100	...
Champion Paper Corp'n, 1st 6s 1945	94	97
Continental Paper Products, 6½s 1943	88	91½
Cornell Wood Prod., 7½s 1937	100	104*
Crown Willamette Paper, 6s 1951	97	101
Donnaconna Paper, 6s 1940	99	102
Dells Paper & Pulp Serial, 6s 1926-38	*95	...
Eastern Mfg. Co., 7s 1938	92	95
Eddy Paper, 7½s 1931	99	102
Escanaba Paper Serial, 6s 1926-39	90	95
Filer Fibre Serial, 7s 1926-39	90	95
Fort Orange Paper, 7s 1942	95	100*
Fox River Paper, 7s 1931	99	...
Gair Co. (The Robt.) 7s 1937	102	105
Gilbert Paper Co., 6½s 1926-29	99	...
Hammermill Paper, 6s 1939	100	103*
Itaska Paper & Prairie River Power J+5½s 1926-38	94	96*
Itaska Paper 1st, 6s 1933-38	96	98*
Kalamazoo Veg. Parchment, 6s 1938	98	...
Lake Superior Pulp & Paper, 6s 1941	102	105*
Marinette & Menominee, 7½s 1936	101	...
Menasha Printing & Carton, 6½s 1939	99½	...
Mengel Company, 7s 1926 to 1934	100*	102
Miami Paper, 7½s 1931	98	...
Monroe Paper Products, 7½s, 1932	96	...
Nakoosa Edwards, 1st Ref. 6s 1928 to 1942	96	99*
Orono Pulp & Paper, 6s 1943	98	...
Orono Pulp & Paper, 5s 1941	94	...
Oswego Falls Corp., 6s 1941	98	100*
Oxford Paper, 6s 1947	100	...
Paepcke Paper Mills, 7s 1930	99	...
Parsons Pulp & Lumber, 7s 1928	97	...
Parker Young Co., 6½s 1944	95	99
Paterson Parchment Paper, 6s 1938	100½	102
Penobscot Chemical Fibre, 6s 1942	98	...
Peshtigo Paper, 7s 1942	50	75
Poland Paper, 7s 1930	98	...
Port Alfred Pulp 6½s 1943	*96	...
Richardson Co., 6s 1938	97	...
Spanish River Pulp & Paper, 8s 1941	106	110
Stevens & Thompson Paper, 6s 1942	91	94
St. Croix Paper, 5s 1926-37	95	98*
St. Regis Paper Serial, 6½s 1926-35	98½	...
Tait Paper & Color Industries, 6s 1934	90	...
Taggart Bros. Co., 6s 1944	97	100*
Ticonderoga Pulp & Paper, 5s 1930	90	95*
Ticonderoga Pulp & Paper, 6s 1940	98	100*
Warren (The S. D.) Company, 6s 1945	98	101
Wotab Paper, 6½s 1943	99	103
Westfield River Paper, 7s 1926-43	Wanted	...
Whittaker Paper, 7s 1942	103	106
Witmer-Parsons Pulp & Lbr. (Units)	63	70

STOCKS	BID	ASKED
Advance Bag & Paper 8% Pfd.	97	100*
Brompton Pulp & Paper 8% Pfd.	93	98*
Brown Corpn., 7% Pfd.	97	100*
Bryant Paper, Com.	11	13
Bryant Paper, Pfd.	9	11
Champion Fibre 7% Pfd.	99	103*
Consolidated Paper, Common	19	24
Diem & Wing, 7% Cum. Pfd.	90	93*
Donnaconna Paper, Com.	49	54
Donnaconna Paper, Pfd.	95	100
Eastern Mfg. Co., 1st Pfd.	34	37
Great Northern Paper, New	64	67*
Hammermill Paper, 7% Pfd.	105	110
Hinde & Dauch, Com.	135	...
Hinde & Dauch, Pfd.	100	...
Marathon Paper Mills, Com.	125	...
Louis DeJonge Co., 7% Pfd.	93	96
Munissing Paper, Com.	10	15*
New York & Penna. Co.	Wanted	None Off.
Oxford Papers, Com.	102	...
Oxford Paper Co., Pfd.	100	105
Penobscot Chemical Fibre, Com.	65	75*
Richardson Co., 7% Pfd.	103	...
Rubberoid Company	65	75
Seaman Container, Class B (par $1)	1	None Off.
Seaman Paper Co.	Wanted	None Off.
St. Croix Paper	150	170
St. Regis Paper Co., 7% Cum. Pfd.	97	100
Westfield River Paper Co., 1st Pfd.	Wanted	None Off.
West Virginia Pulp and Paper, Com.	58	63
West Virginia Pulp and Paper, Pfd.	97	102
Whittaker Paper, 7% Cum. Pfd.	99	103

* Nominal.

Paper

(F. o. b. Mill)

Ledgers	11.00	@38.00
Bonds	9.00	@45.00
Writings—		
Extra Superfine	14.00	@32.00
Superfine	14.00	@32.00
Tub sized	10.00	@15.00
Engine Sized	8.00	@11.00
News—		
Rolls, contract	3.25	@ —
Rolls, transient	3.25	@ 3.50
Sheets	3.65	@ 3.85
Side Runs	3.00	@ 3.75
Book, Cased—		
S. & S. C.	7.00	@ 9.75
M. F.	6.25	@ 8.75
Coated and Enamel	8.00	@15.00
Lithograph	8.00	@15.00
Tissues—Per Ream—		
White No. 1	.80	@ 1.00
Anti-Tarnish	1.10	@ 1.90
Colored	1.00	@ 2.00
White No. 2	.75	@ .85
Kraft	.90	@ 1.00
Manila	.75	@ .85
Kraft—		
No. 1 Domestic	6.25	@ 6.50
No. 2 Domestic	5.25	@ 5.50
Southern	4.75	@ 5.25
Imported	6.50	@ 7.00
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.75	@ 5.25
No. 2 Wood	4.00	@ 4.50
Butchers	3.75	@ 4.25
Fibre Papers—		
No. 1 Fibre	5.00	@ 5.50
No. 2 Fibre	4.75	@ 5.25
Common Bogus	2.75	@ 3.00
Screenings	3.00	@ 3.25
Card Middles	4.00	@ 5.00
Boards—per ton—		
News	42.50	@45.00
Straw	57.50	@60.00
Chip	40.00	@42.50
Binders' Boards	65.00	@70.00
Sgl. Mla. Ll. Chip.	52.50	@55.00
Wood Pulp	67.50	@72.50
Container	60.00	@65.00
Glassine—		
Bleached, basis 25 lbs.	13.00	@16.00
Bleached, basis 20 lbs.	15.00	@16.00

Mechanical Pulp

(Ex-Dock)

No. 1 Imported—		
Moist	34.00	@36.00
Dry	36.00	@38.00
(F. o. b. Mill)		
No. 1 Domestic	27.00	@30.00
Screenings	15.00	@20.00

Chemical Pulp

(Ex-Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	3.75	@ 4.50
Easy Bleaching	3.20	@ 3.35
No. 1 strong unbleached	2.95	@ 3.05
Mitscherlich unbleached	3.00	@ 3.40
No. 2 strong unbleached	2.85	@ 2.90
No. 1 Kraft	2.90	@ 3.05
Sulphate—		
Bleached	3.75	@ 4.00
(F. o. b. Pulp Mill)		
Sulphite (Domestic)—		
Bleached	3.65	@ 4.75
Easy Bleaching Sulphite	3.00	@ 3.25
News Sulphite	2.65	@ 2.85
Mitscherlich	3.25	@ 3.75
Kraft (Domestic)	2.85	@ 3.40
Soda Bleached	3.75	@ 4.00
Sulphate Screenings—		
Coarse	.75	@ .85
Refined	1.50	@ 1.85

Domestic Rags

New Rags

Prices to Mill f. o. b. N. Y.

Shirt Cuttings—		
New White, No. 1	11.00	@11.50
New White, No. 2	7.50	@ 8.00
Silesias No. 1	7.00	@ 7.50
New Unbleached	10.50	@11.00
Washables	4.25	@ 4.75
Fancy	5.25	@ 5.75
Blue Overall	7.00	@ 7.50
New Blue Prints	5.25	@ 5.50
New Soft Blacks	4.00	@ 4.25
Mixed Khaki Cuttings	4.25	@ 5.00
Pink Corset Cuttings	9.50	@10.00
O. D. Khaki Cuttings	5.25	@ 5.75
Men's Corduroy	4.00	@ 4.50
New Mixed Blacks	3.50	@ 3.75

Old Rags

White, No. 1—		
Repacked	5.50	@ 6.00
Miscellaneous	4.75	@ 5.25
White, No. 2—		
Repacked	3.25	@ 3.75
Miscellaneous	2.75	@ 3.00
St. Soiled, White	2.50	@ 2.75
Thirds and Blues—		
Repacked	2.25	@ 2.50
Miscellaneous	1.75	@ 2.00
Black Stockings	3.25	@ 3.75
Roofing Rags—		
Cloth Strippings	1.70	@ 1.80
No. 1	1.70	@ 1.80
No. 2	1.40	@ 1.50
No. 3	1.25	@ 1.35
No. 4	1.25	@ 1.35
No. 5A	.95	@ 1.05

Foreign Rags

New Light Silesias	6.75	@ 7.25
Light Flannelettes	7.50	@ 8.00
Unbleached Cottons	9.50	@10.50
New White Cuttings	10.00	@11.00
New Light Oxfords	7.00	@ 7.50
New Light Prints	5.50	@ 6.50
New Mixed Cuttings	3.00	@ 3.50
New Dark Cuttings	2.75	@ 3.25
No. 1 White Linens	7.00	@ 7.75
No. 2 White Linens	5.00	@ 5.50
No. 3 White Linens	4.00	@ 4.50
No. 4 White Linens	3.00	@ 3.50
Old Extra Light Prints	2.75	@ 3.00
Ord. Light Prints	2.25	@ 2.50
Med. Light Prints	1.85	@ 2.10
Dutch Blue Cottons	2.25	@ 2.50
German Blue Linens	2.25	@ 2.50
German Blue Cottons	2.00	@ 2.25
Checks and Blues	1.75	@ 2.00
Lindsay Garments	1.80	@ 1.90
Dark Cottons	1.70	@ 1.80
Shoppery	1.50	@ 1.60
French Blues	2.25	@ 2.50

Old Rope and Bagging

Prices to Mill f. o. b. N. Y.

Gunny No. 1—		
Foreign	1.60	@ 1.70
Domestic	1.65	@ 1.75
Wool Tares, light	1.60	@ 1.70
Wool Tares, heavy	1.60	@ 1.70
Bright Bagging	1.50	@ 1.60
Small Mixed Rope	1.50	@ 1.65
Manila Rope—		
Foreign	3.50	@ 4.00
Domestic	4.50	@ 5.00
New Burlap Cut	3.00	@ 3.25
Hessian Jute Threads—		
Foreign	3.50	@ 4.00
Domestic	3.25	@ 3.50

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, White, No. 1	3.50	@ 3.75
Hard, White, No. 2	3.15	@ 3.25
Soft, White, No. 1	2.90	@ 3.10
Flat Stock—		
Stitchless	1.25	@ 1.35
Overissue Mag.	1.25	@ 1.35
Solid Flat Book	1.15	@ 1.25
Crumpled No. 1	.80	@ .90
Solid Book Ledger	1.90	@ 2.10
Ledger Stock	1.50	@ 1.60
New B. B. Chips	.60	@ .70
Manilas—		
New Env. Cut	2.40	@ 2.60
New Cuttings	1.60	@ 1.85
Extra No. 1 old	1.25	@ 1.35
Print	.70	@ .75
Container Board	.60	@ .65
Bogus Wrapper	.75	@ .80
Old Kraft Machine Compressed bales	2.00	@ 2.15
News—		
No. 1 White News	1.50	@ 1.60
Strictly Overissue	.65	@ .75
Strictly Folded	.55	@ .60
No. 1 Mixed Paper	.45	@ .50
Common Paper	.27	@ .32

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PORT HURON SULPHITE AND PAPER CO.

PORT HURON, MICH.

Manufacturers

Mitscherlich Machine Glazed Waxing and Creping Papers

Also

TAG, DOCUMENT and CYLINDER-SPECIALTIES

1888-1927

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Master Makers of Printing Papers

PHILADELPHIA

DILCOL MACHINE FINISH
Smooth surface and good color.

FLAT WHITE
Clean English Finish with a high white color.

SUEDE FINISH
A remarkable book paper with a medium antique surface.

REGAL ANTIQUE
Rough surface with unusual bulk for weight.

CANTERBURY BOOK
Wove and laid with deckle edges. A beautiful book paper. Also made in 2 and 3 ply pasted sheets.

DE & SE TINTS
The rainbow line. A smooth even surface for halftones up to 120 screen.

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A smooth surface cover with deckle edges.

DILCOL OFFSET
Free from loose fibres and fuzz. Exceptional strength and folding qualities.

DUCHESS COVER
Deckle edges. Medium finish in white and six tints. Also made with ripple finish.

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Made for the purpose—quick drying qualities.

DILCOL COATED BOOK
Medium priced, suitable for fine screen halftones.

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The finest sheet of its class made.

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Coated one side. Especially made for process color work.

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Similar to Black & White in all respects save color.

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The best printing dull coated paper on the market.

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A medium priced semi-dull coated sheet that prints beautifully.

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A coated bristol with high, glossy surface.

DILFOLD ENAMEL
A folding paper with an exceptional printing surface

DILCOL SUPER-CALENDERED
Splendid printing qualities and a clean, durable surface.

There Is a D & C Paper For Every Printing Requirement

Twines
(F. o. b. Mill)

Cotton—			
No. 1	.26	@	.27
No. 2	.24	@	.25
No. 3	.22	@	.23
B. C., 18 basis	.36	@	.38
A. B. Italian, 18 basis	.46	@	.51
Finished Jute—			
Dark 18 basis	.24	@	.25
Light 18 basis	.27	@	.28
Jute Wrapping, 3-6 Ply—			
No. 1	.21	@	.23
No. 2	.20	@	.22
Tube Rope—			
4-ply and larger	.18	@	.19
Fine Tube Yarn—			
5-ply and larger	.23	@	.27
4-ply	.24	@	.28
3-ply	.26	@	.30
Unfinished India—			
Basis	.16	@	.17
Paper Makers' Twine			
Balls	.13	@	.15
Box Twine, 2-3 ply	.17	@	.19
Jute Rope	.21	@	.23
Ameri. Hemp, 6	.29	@	.31
Sisal Hay Rope—			
No. 1 Basis	.18	@	.20
No. 2 Basis	.16	@	.18
Sisal Lath Yarn—			
No. 1	.16	@	.18
No. 2	.14	@	.16
Manila Rope	.24	@	.26

CHICAGO

All Rag Bond	.35	@	.41
No. 1 Rag Bond	.25	@	.35
No. 2 Rag Bond	.14	@	.25
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¾	@	.11
Superfine writing	.18	@	.24
No. 1 fine writing	.14	@	.18
No. 2 fine writing	.12	@	.14
No. 3 fine writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¼	@	.07¼
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
News—Roll, mill	.03½	@	.04¼
News—Sheets, mill	.03¾	@	.04¾
No. 1 Manila	.04¾	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butchers' Manila	.04	@	.04½
No. 1 Kraft	.05¾	@	.06¼
Southern Kraft	.04½	@	.05
No. 2 Kraft	.05	@	.05¼
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue—			
24 x 36 sheet	.07	@	.07¾
White Tissue—			
20 x 30 sheet	.07¼	@	.07½
Boards, per ton— (Delivered Central Territory)—			
Plain Chip	42.50	@	45.00
Solid News	45.00	@	47.50
Manila Line Chip	55.00	@	57.50
Container Lined— (Delivered Central Territory)—			
85 Test	65.00	@	70.00
100 Test	70.00	@	75.00

Old Papers
F. o. b. Chicago

Shavings—			
No. 1 Hard White	3.60	@	3.70
White Env. Cuttings	3.60	@	3.70
No. 1 Soft Shavings	2.90	@	3.00
No. 1 Mixed	1.35	@	1.45
No. 2 Mixed	1.05	@	1.10
Ledger & Writings	1.45	@	1.60
Solid Books	1.20	@	1.30
Blanks	1.65	@	1.75
Krafts	1.80	@	1.90
New Kraft Cuts	2.25	@	2.35
Manila Envelope Cuttings	2.00	@	2.10
Ex. No. 1 Manila	1.55	@	1.65
Print Manila	.75	@	.85
Folded News (overissue)	.75	@	.85
Old Newspapers—			
No. 1	.65	@	.70
No. 2	.55	@	.60
Mixed Papers—			
No. 1	.60	@	.65
Roofing Stocks— F.o.b. Chicago, net cash			
No. 1	30.00	@	—
No. 2	28.00	@	—

BOSTON

Paper
F. o. b. Mill

Ledgers—			
Sulphite	.07½	@	.15
Rag content	.15	@	.30
All Rag	.38	@	.52½
Bonds—			
Sulphite	.06½	@	.11½
Rag content	.17	@	.45
All Rag	.36½	@	.55
Writings	.07	@	.20
Superfines	.22	@	.50
News	.04	@	.04½
Book, Super	.07	@	.10
Book, M. F.	.06¾	@	.09¾
Book, Coated	.08½	@	.20
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.06	@	.06½
No. 2 Kraft	.05	@	.05¾
Common Bogus	.02¼	@	.02½
Delivered New England points			
Straw Board			55.00
Filled News Board			47.50
Chip Board			45.00
Single Manila Pulp lined board	55.00	@	60.00
Single White, patent coated board bender	75.00	@	80.00
Wood Pulp Board	80.00	@	85.00
Binder Boards	70.00	@	75.00
F. o. b. mill			
Tarred Felts—			
Regular	61.00	@	63.00
Slaters	66.00	@	68.00
Best Tarred, 1 Ply, roll	1.50	@	1.60
Best Tarred, 2 Ply, roll	1.70	@	1.80
Best Tarred, 3 Ply, roll	2.00	@	2.10

Old Papers

Shavings—			
No. 1 Hard White	3.25	@	3.75
White Blank News	1.55	@	1.65
Manila Env. Cuttings	2.00	@	2.25
No. 2 Hard White	3.00	@	3.25
No. 1 Soft White	.03	@	.03¼
No. 2 Soft White	.02½	@	.03
No. 1 Mixed	1.10	@	1.15
No. 2 Mixed	.85	@	.90
Solid Ledger Stock	1.90	@	2.00
No. 1 Books, Heavy	1.15	@	1.25
No. 1 Books, Light	—	@	.85
No. 1 New Manila	2.25	@	2.50
No. 1 Old Manila	1.50	@	1.75
Print Manila	.85	@	.95
Old Kraft	2.20	@	2.30
Overissue News	.65	@	.75
Old Newspapers	.62½	@	.67½
No. 1 Mixed Paper	.45	@	.52½
Box Board, Chip	.45	@	.60

Bagging
Price f. o. b. Boston

Gunny No. 1—			
Foreign	1.75	@	—
Domestic	1.60	@	—
Manila Rope—			
Foreign	4.00	@	—
Domestic	4.50	@	5.00
Mixed Rope	1.25	@	—
Scrap Burlaps	1.35	@	—
Wool Tares, heavy	1.50	@	1.60
Mixed Strings	1.20	@	1.30
New Burlap Cutting	2.50	@	2.75

Domestic Rags (New)
Price f. o. b. Boston

Shirt Cuttings—			
New White, No. 1	.11½	@	—
Silesias, No. 1	.07	@	—
New Unbleached	.10	@	—
Fancy	.05½	@	—
Washable	.04½	@	—
Cottons—According to Grades—Blue—			
Blue overalls	.07	@	—
New Black, soft	3.50	@	4.00
Khaki Cuttings	.04½	@	.05½
Corduroy	.03½	@	.04
New Canvas	.09	@	.10

Domestic Rags (Old)
Price f. o. b. Boston

White No. 1	5.50	@	—
Repacked	6.25	@	6.50
Miscellaneous	5.00	@	—
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Thirds and Blues—			
Repacked	2.60	@	—
Miscellaneous	2.15	@	2.25
Roofing Stock—			
No. 1	1.70	@	1.75
No. 2	1.45	@	1.55
No. 3	1.15	@	1.25
No. 4	1.15	@	1.25

PHILADELPHIA

Paper
F. o. b. Mill

Bonds	.07	@	.40
Ledgers	.11	@	.40
Writings—			
Superfine	.13	@	.18
Extra fine	—	@	.22
Fine	.20	@	.26½
Fine, No. 2	.16	@	.25
Fine, No. 3	.12	@	.20
Book, M. F.	.06¾	@	.07
Book, S. S. & C.	.06	@	.07½
Book, Coated	.11	@	.16
Coated Lithograph	.09	@	.12
Label	.09	@	.12
News	.03¾	@	.04
No. 1 Jute Manila	.09½	@	—
Manila Sul., No. 1	.04½	@	.06
Manila No. 2	.04	@	.04½
No. 2 Kraft	.05	@	.05¼
No. 1 Kraft	.06	@	.06¼
Common Bogus	.02¾	@	—
Straw Board	55.00	@	56.00
News Board	40.00	@	42.50
Chip Board	37.50	@	40.00
Wood Pulp Board	4.50	@	5.00
(Carload Lots)			
Binder Boards—			
No. 1, per ton	85.00	@	90.00
No. 2, per ton	70.00	@	75.00
Carload lots	60.00	@	65.00
Tarred Felts—			
Regular	66.00	@	58.00
Slaters	70.00	@	72.00
Best Tarred, 1-ply (per roll)	1.85	@	1.95
Best Tarred, 2-ply (per roll)	1.55	@	1.70
Best Tarred, 3-ply	2.10	@	2.15
No. 1 Mixed Paper	.65	@	.70

Domestic Rags (New)
Price to Mill, f. o. b. Phila.

Shirt Cuttings—			
New White, No. 1	.11½	@	.12
New White, No. 2	.07	@	.07½
Light Silesias	.07	@	.07½
Silesias, No. 1	.07½	@	.08
Black Silesias (soft)	.05	@	.05½
New Unbleached	.11	@	.11½
Washable	.05	@	.05¾
Fancy	.05½	@	.06
Cottons—according to grades—			
Blue Overall	.07½	@	.08
New Blue	.03½	@	.04
New Black Soft	.05½	@	.06
New Light Seconds	.03	@	.03½
Khaki Cuttings	.05	@	.05½
Corduroy	.03½	@	.03¾
New Canvas	.08	@	.09
New Black Mixed	.05	@	.05½

Bagging
F. o. b. Phila

Gunny, No. 1—			
Foreign	3.50	@	3.60
Domestic	3.25	@	3.50
Manila Rope	4.25	@	4.50
Sisal Rope	1.25	@	2.00
Mixed Rope	1.25	@	1.50
Scrap Burlaps	2.00	@	2.25
Wool Tares, heavy	2.00	@	2.25
Mixed Strings	1.75	@	2.00
No. 1, New Light Burlap	3.25	@	3.50
New Burlap Cuttings	3.25	@	3.50

Old Papers
F. o. b. Phila.

Shavings—			
No. 1 Hard White	3.50	@	3.60
No. 2 Hard White	3.00	@	3.25
No. 1 Soft White	2.80	@	2.90
No. 2 Soft White	1.90	@	2.00
No. 1 Mixed	1.50	@	1.60
No. 2 Mixed	.90	@	1.00
Solid Ledger Stock	1.90	@	2.00
Writing Paper	1.65	@	1.75
No. 1 Books, heavy	1.15	@	1.20
No. 2 Books, light	.80	@	.85
No. 1 New Manila	2.40	@	2.50
No. 1 Old Manila	1.50	@	1.60
Print Manila	1.00	@	1.10
Container Manila	.90	@	1.00
Old Kraft	2.00	@	2.20
Common Paper	.50	@	.60
No. 1 Mixed Paper	.60	@	.70
Straw Board, Chip	.75	@	.80
Binders Board, Chip	.75	@	.80
Overissue News	.80	@	.90
Old Newspaper	.60	@	.70

Domestic Rags (Old)

White, No. 1—			
Repacked	5.00	@	5.25
Miscellaneous	4.75	@	5.00
White, No. 2—			
Repacked	.03½	@	.04
Miscellaneous	.02	@	.02¼
Thirds and Blues—			
Repacked	2.50	@	2.75
Miscellaneous	1.75	@	2.00
Black Stockings	3.25	@	3.50
Roofing Stock—			
No. 1	1.55	@	1.65
No. 2	1.40	@	1.50
No. 3	1.25	@	1.35
No. 4	1.20	@	1.30
No. 5A	.90	@	1.00
B	.80	@	.90
C	.80	@	.90

TORONTO

Paper
F. o. b. Mill

Bond—			
No. 1 Sulphite	.12½	@	—
No. 2 Sulphite	.10¾	@	—
No. 1 Colored	.13½	@	—
No. 2 Colored	.11¼	@	—
Ledgers (sulphite)	—	@	.13
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09¼	@	—
News f. o. b. Mills—			
Rolls (carloads)	3.25	@	—
Sheets (carloads)	3.75	@	—
Sheets (2 tons or over)	4.00	@	—
Book—			
No. 1 M. F. (carloads)	7.75	@	—
No. 2 M. F. (carloads)	7.50	@	—
No. 3 M. F. (carloads)	7.25	@	—
No. 1 S. C. (carloads)	8.25	@	—
No. 2 S. C. (carloads)	8.00	@	—
No. 3 S. C. (carloads)	7.75	@	—
No. 1 Coated and litho	14.50	@	—
No. 2 Coated and litho	13.50	@	—
No. 3 Coated and litho	12.75	@	—
Coated tinted	.15	@	—
Wrapping—			
Rag Brown	4.85	@	—
White Rap	5.25	@	—
"B" Manila	5.65	@	—
No. 1 Manila	6.65	@	—
Fiber	6.65	@	—
Kraft, M. F.	7.20	@	—
M. G.	7.35	@	—

Pulp
(F. o. b. Mill)

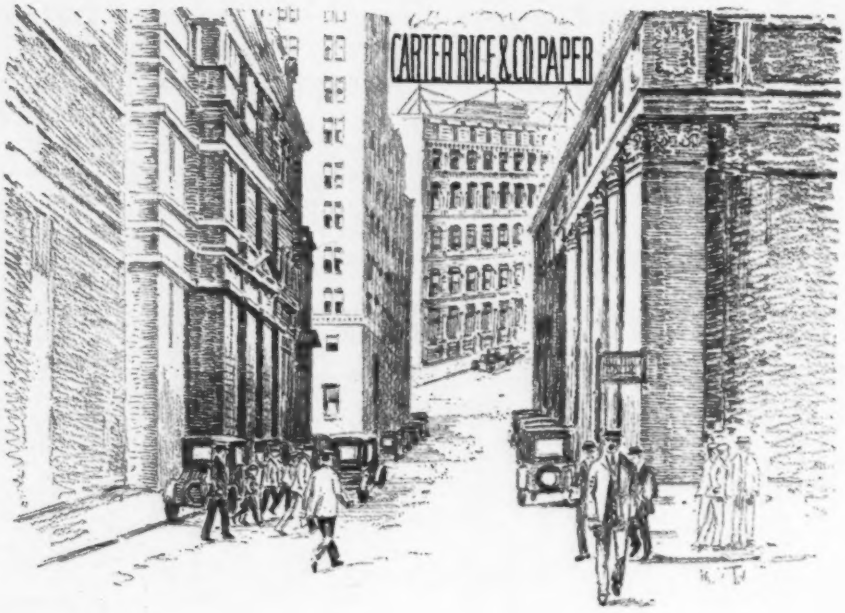
Ground wood	28.00	@	32.00
Sulphite easy bleaching	63.00	@	65.00
Sulphite news grade	55.00	@	60.00
Sulphite, bleached	80.00	@	—
Sulphate	65.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	3.60	@	—
Soft White Book shavings	3.00	@	—
White Blk., News	1.50	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.25	@	—
Light and Crumpled Book Stock	1.10	@	—
Ledgers and Writings	1.40	@	—
Solid Ledgers	1.40	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	1.00	@	—
Kraft	2.25	@	—
News and Scrap—			
Strictly Overissue	.80	@	—
Folded News	.80	@	—
No. 1 Mixed Papers	.60	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

	Per lb.		
No. 1 White Shirt Cuttings	.10½	@	—
Fancy Shirt Cuttings	.05	@	.05½



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J. R. Booth, Ltd., Ottawa, Ont.

News Print

PAPER AND PAPER STOCK IMPORTS AND EXPORTS OF THE UNITED STATES

For the Month Ending December 31, 1926 and for the Twelve Months Ending December 31, 1926 as Compared with Corresponding Months of Previous Year

IMPORTS—PAPER

	December				Twelve Months Ending December 31			
	1925		1926		1925		1926	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Paper and manufactures (total)	.....	$10,009,291	.....	$12,710,148	.....	$119,200,611	.....	$139,537,144
Printing paper—								
Standard news print ....lbs...free	244,170,265	8,766,146	340,317,003	11,365,765	2,896,850,378	103,717,055	3,701,350,149	123,981,715
Imported from—								
Finland	1,233,342	37,485	7,651,650	226,662	43,369,352	1,328,376	68,583,218	2,025,980
Germany	2,264,701	008'0Z	753,012	22,668	51,730,172	1,606,346	25,769,291	766,574
Netherlands	.....	.....	.....	.....	1,050,608	34,157	.....	.....
Norway	337,612	11,467	2,790,108	75,080	35,129,194	1,068,637	12,352,543	349,984
Sweden	11,255,860	341,513	4,960,576	141,277	131,035,514	3,946,463	92,040,283	2,749,177
Canada	214,037,532	7,809,443	285,357,282	9,598,524	2,590,648,236	94,253,570	3,313,717,595	111,924,211
Other countries	15,041,218	495,438	38,804,375	1,301,554	43,887,302	1,479,506	188,887,219	6,165,789
All other, n. e. s.....lbs...dut.	707,853	36,541	1,478,279	74,854	16,610,850	809,260	16,376,478	826,512
Grease-proof and water-proof papers..lbs...dut.	277,642	34,873	206,965	24,945	2,278,940	288,973	2,226,951	383,028
Kraft wrapping paper .....lbs...dut.	1,110,789	50,490	842,565	38,030	14,419,611	605,666	8,867,689	390,958
All other wrapping paper.....lbs...dut.	212,324	12,367	258,306	17,535	5,550,040	269,737	5,556,310	366,687
Writing, drawing, bond, etc.....lbs...dut.	332,826	68,894	321,331	103,325	3,219,715	744,912	3,761,346	928,336
Surface coated .....lbs...dut.	142,158	46,021	137,850	57,440	1,564,545	530,715	2,067,589	756,145
Tissue paper .....lbs...dut.	204,462	91,196	250,388	142,357	2,714,343	1,163,595	2,882,185	1,405,192
Pulp boards in rolls .....lbs...dut.	4,962,012	159,779	3,521,336	82,940	72,695,361	1,912,973	70,764,659	1,718,425
Other paper boards, n. e. s.....lbs...dut.	2,929,255	74,112	3,699,963	99,438	30,357,608	746,320	40,222,000	915,680
Cigarette paper, cigarette books and cover .....lbs...dut.	1,045,556	277,908	727,194	208,665	10,651,318	2,934,572	8,276,285	2,182,583
Hanging paper .....lbs...dut.	547,793	65,955	442,234	71,777	5,516,346	562,934	3,529,453	597,436
Paper boxes .....lbs...dut.	180,877	82,065	194,513	92,491	2,329,394	1,349,525	2,104,225	964,536
Pulp or papier-mâché and manufactures of, n. e. s. .....lbs...dut.	.....	.....	151,179	35,007	.....	.....	1,868,393	404,593
Duplex decalcomania, not printed.....lbs...free	55,548	13,936	115,755	26,320	436,315	111,705	689,544	170,483
All other .....dut.	.....	229,008	.....	269,259	.....	3,452,669	.....	3,544,835

WOOD PULP

Mechanically ground wood pulp.....ton..free	29,000	837,334	20,139	610,558	295,618	8,517,116	271,213	8,278,220
Chemical wood pulp—								
Sulphite pulp, unbleached .....ton..free	54,889	2,914,228	71,631	4,262,127	579,284	31,542,079	628,923	37,032,470
Sulphite pulp, bleached .....ton..free	21,451	1,713,739	28,692	2,310,044	286,976	22,527,879	294,729	23,677,929
Total sulphite pulp .....ton	76,340	4,627,967	100,323	6,572,171	866,260	54,069,958	923,652	60,710,399
Imported from—								
Finland	4,148	233,526	6,884	359,476	53,126	2,806,164	64,543	3,569,662
Germany	5,116	251,633	4,119	301,074	59,524	3,684,265	80,249	5,490,614
Norway	4,385	332,287	6,546	480,769	68,750	5,175,297	64,029	5,080,313
Sweden	20,177	1,208,578	46,478	2,937,916	264,611	15,595,171	303,548	18,779,809
Canada	39,090	2,499,325	34,054	2,346,055	391,268	25,222,384	378,917	25,792,785
Other countries	3,424	102,618	2,242	146,881	28,981	1,586,677	32,366	1,997,216
Sulphate pulp, unbleached (Kraft pulp) .....ton..free	25,433	1,592,409	26,572	1,689,410	306,073	18,257,446	334,803	21,214,576
Imported from—								
Finland	1,042	55,852	877	55,899	16,524	884,425	22,193	1,264,028
Norway	434	28,406	1,626	107,680	9,661	579,281	10,874	727,559
Sweden	13,706	848,929	13,312	811,170	148,214	8,359,460	158,866	9,720,475
Canada	10,251	659,222	10,757	714,661	127,539	8,165,142	139,877	9,323,049
Other countries	.....	.....	.....	.....	4,135	269,138	2,993	179,465
Sulphate pulp, bleached .....ton..free	2,118	120,549	2,056	140,642	17,419	989,933	16,147	1,048,662
Other pulp .....ton..free	110	7,921	1,299	76,522	2,123	151,726	3,857	256,331

CRUDE PAPER STOCK

Rags for paper stock .....lbs...free	33,173,645	883,736	38,423,419	809,489	572,431,511	15,828,320	476,764,483	10,372,689
Waste bagging, waste paper, etc.....lbs...free	9,046,855	168,704	8,008,261	182,320	128,871,569	2,274,403	113,322,087	2,394,680
Old rope and all other paper stock...lbs...free	8,760,587	327,014	3,302,343	140,747	71,198,576	3,576,230	79,035,894	3,074,995

CHEMICALS AND OTHER PAPER MAKERS' MATERIALS

Colors, dyes, stains, color acids, and color bases, n. e. s. .....lbs...dut.	829,484	822,461	302,535	360,931	5,785,465	7,166,335	4,972,949	5,600,655
Imported from—								
France	6,947	10,989	7,952	11,394	118,760	166,666	178,181	240,731
Germany	362,530	393,425	95,863	96,854	2,932,216	3,757,846	2,179,374	2,323,272
Italy	11,829	12,735	6,635	6,277	203,984	247,469	92,446	111,183
Switzerland	412,692	352,493	116,097	148,170	1,972,416	2,261,822	1,864,891	2,171,317
United Kingdom	8,187	9,033	34,071	34,803	170,443	144,621	200,912	202,642
Other countries	27,299	43,786	41,917	63,433	387,646	587,911	457,145	551,510
Casein or lactarene .....lbs...dut.	903,227	78,715	1,463,702	168,469	18,803,816	1,573,335	26,281,126	2,851,537
Kaolin, china, and paper clay.....ton...dut.	26,897	268,410	28,156	277,463	332,622	3,195,527	353,746	3,483,550

(*Continued on page 323*)

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PAPER AND PAPER STOCK IMPORTS AND EXPORTS OF THE UNITED STATES

(Continued from page 321)

EXPORTS—PAPER

PAPER AND MANUFACTURES OF	December 1925 Quantity	December 1925 Value	December 1926 Quantity	December 1926 Value	Twelve Months Ending December 31 1925 Quantity	Twelve Months Ending December 31 1925 Value	Twelve Months Ending December 31 1926 Quantity	Twelve Months Ending December 31 1926 Value
Paper and manufactures (total)	.....	$2,243,099	.....	$2,328,963	.....	$23,843,710	.....	$26,828,674
Printing paper—								
News print paper ....lbs.	3,885,504	177,366	1,803,398	79,034	45,476,381	2,025,153	38,517,652	1,849,273
Exported to—								
Canada	111,766	7,585	119,560	8,987	1,172,023	80,400	1,744,469	121,668
Central America	153,012	8,796	70,686	3,302	1,239,785	65,649	1,156,347	52,931
Mexico	102,373	6,365	81,739	3,021	1,845,477	94,097	1,132,273	56,648
Cuba	1,456,525	63,111	380,834	16,312	18,271,567	750,238	6,807,346	306,078
South America	447,359	20,945	882,149	35,684	7,500,947	345,516	8,338,217	372,794
China	593,920	22,355	223,682	9,729	5,521,791	240,291	8,212,550	385,263
Japan	226,747	10,818	.....	.....	2,497,429	112,456	1,903,594	84,837
Philippine Islands	568,083	26,697	14,029	563	5,715,760	256,858	7,099,626	355,422
Other countries	225,719	10,694	30,719	1,436	1,711,602	79,648	2,123,230	113,632
Book paper, not coated ....lbs.	1,657,048	169,118	1,749,294	151,470	17,347,897	1,934,630	18,085,094	1,721,655
Exported to—								
United Kingdom	16,271	3,024	3,222	536	148,683	25,545	554,708	78,972
Canada	226,861	24,720	369,584	28,136	2,242,287	273,439	4,162,026	352,376
Central America	62,230	6,394	29,920	3,161	688,423	72,844	596,081	65,240
Mexico	196,798	23,005	46,800	5,371	1,767,477	209,908	1,446,788	147,327
Cuba	321,180	27,158	301,441	34,825	4,687,485	460,579	3,173,570	315,806
Argentina	51,314	7,561	58,559	4,956	773,802	84,473	628,170	53,667
Brazil	10,261	1,348	.....	.....	285,734	40,986	286,998	31,055
Venezuela	144,581	16,055	53,206	4,923	788,908	74,891	565,421	57,470
Other South America	162,644	14,237	88,014	7,014	1,321,528	128,310	857,012	78,617
China	182,473	16,973	31,099	2,465	947,603	170,477	1,077,004	102,430
Philippine Islands	170,591	16,052	268,496	20,296	1,562,331	145,080	1,983,530	165,035
Australia	33,907	3,782	63,400	7,274	516,315	57,896	664,422	73,569
Other countries	77,937	8,809	435,553	32,513	1,617,322	190,202	2,089,364	200,091
Cover paper ....lbs.	135,560	23,570	204,364	28,416	1,214,945	230,779	1,559,723	268,956
Grease-proof and waterproof paper ....lbs.	123,277	18,965	194,812	27,006	2,115,356	281,780	2,418,594	354,125
Wrapping paper ....lbs.	3,042,070	224,098	2,733,563	187,567	28,735,690	2,173,029	33,015,471	2,234,479
Surface-coated paper ....lbs.	320,552	51,424	474,839	58,627	3,802,117	561,787	5,903,248	744,982
Tissue and crepe paper ....lbs.	450,073	102,521	461,337	88,078	3,741,770	958,483	4,400,260	1,080,131
Toilet paper ....lbs.	456,744	50,802	665,149	72,864	5,043,550	604,208	5,272,355	648,173
Paper towels and napkins ....lbs.	167,504	24,036	157,507	22,511	1,618,177	244,170	2,029,735	294,544
Box board ....lbs.	4,053,756	121,752	4,511,228	134,886	22,482,359	796,089	52,396,919	1,500,338
Bristols and bristol board ....lbs.	187,341	18,386	97,896	11,748	1,132,939	129,557	1,527,090	173,024
Other paper board and strawboard ....lbs.	3,381,551	165,913	3,293,927	194,154	32,375,428	1,581,421	40,313,371	2,029,696
Sheathing and building paper ....lbs.	1,282,927	55,960	905,261	32,262	12,833,552	590,840	11,844,501	504,776
Wall board of paper or pulp....sq. ft.	1,260,442	45,996	3,120,441	105,997	14,096,802	474,935	25,476,157	879,161
Blotting paper ....lbs.	321,306	39,361	267,046	36,850	2,919,669	355,782	3,247,203	404,386
Filing folders, index cards, and other office forms ....lbs.	60,841	23,536	78,297	24,614	649,275	219,021	808,114	237,338
Papeteries (fancy writing paper) ....lbs.	63,783	21,515	90,573	21,893	541,157	190,561	708,105	213,077
Other writing paper ....lbs.	581,707	90,021	1,203,868	187,278	4,021,623	708,820	10,402,956	1,661,952
Cigarette paper and books ....lbs.	37,924	15,747	8,896	2,195	493,895	151,762	326,660	70,663
Paper hangings (wall paper) ....yds.	1,706,085	47,802	1,307,425	29,139	22,753,684	590,340	22,141,719	571,831
Paper bags ....lbs.	1,117,644	102,925	1,417,504	119,604	12,881,256	1,134,358	11,533,883	1,023,728
Boxes and cartons ....lbs.	1,348,579	106,156	1,970,401	146,044	17,095,240	1,300,957	19,825,860	1,433,754
Envelopes ....lbs.	243,407	47,519	200,742	36,996	2,490,768	475,510	2,682,956	483,532
Vulcanized fiber, sheets, strips, rods, and tubes ....lbs.	413,328	123,602	348,843	115,814	5,579,325	1,663,688	5,353,522	1,590,023
Manufactures of vulcanized and indurated fiber ....lbs.	29,989	12,311	45,493	25,466	413,129	182,382	525,400	165,929
Cash-register and adding-machine paper....lbs.	126,005	13,140	211,600	21,089	1,632,760	169,427	2,008,532	205,164
Other paper and paper products	.....	349,557	.....	367,361	.....	4,114,241	.....	4,483,984
WOOD PULP AND PAPER STOCK								
Sulphite wood pulp ....tons	1,865	119,077	1,792	112,913	22,675	1,362,004	20,875	1,345,686
Soda wood pulp ....tons	325	27,508	130	8,490	2,455	223,039	1,605	132,690
Other wood pulp ....tons	905	42,974	45	3,338	8,794	856,069	8,078	605,848
Rags, and other paper stock ....lbs.	12,751,932	193,887	20,443,986	266,142	176,921,484	3,274,903	195,019,659	2,765,360
PAPER AND PULP MILL MACHINERY								
Paper and pulp mill machinery ....lbs.	978,433	234,166	2,267,044	477,437	7,364,403	1,717,451	18,920,544	3,846,109

$20,000,000 WESTERN TABLETS

A new issue of $2,000,000 Western Tablet & Stationery Corporation first mortgage fifteen-year 6 per cent sinking fund bonds was offered by a syndicate headed by West & Co. and including the Federal Securities Corporation. A. B. Leach & Co., and the Illinois Merchants Trust Company. The bonds were priced at 99½. Earnings after depreciation but before interest and Federal taxes averaged $595,611 annually during the 7 years and 10 months ended September 30, 1926. This is equal to 4¾ times the annual interest charges on the bonds now offered. For the ten months ended September 30, 1926, earnings were to more than six times annual interest charges. Proceeds from the bonds will be used in part to pay for properties acquired, etc.

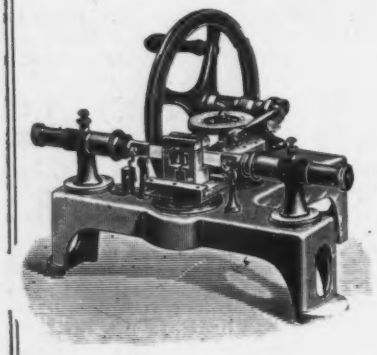
ENVELOPE CO'S EARNINGS UP

The United Envelope Company reports net earnings for 1926, after all charges and Federal taxess, were $940,197, equal after preferred dividends, to $37.72 a share on 17.500 shares of com mon stock. This compares with $794,449 or $29,39 a share in 1925. After dividends of $26 a share, surplus was $485,197.

RIVER ROUGE BOARD MILL COMPLETED

The new board mill recently built by the Consolidated Paper Company at River Rouge, Mich., is now complete. The stock for the machines will be prepared by six New Type Dilts Beaters. This mill will make a high grade of binder board to be used by the many automobile plants in Detroit.

SCHOPPER
FOLDING TEST



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AMERICAN PAPER
AND
PULP ASSOCIATION
Eighth Annual
1918 — 1919

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History of the AMERICAN PAPER AND PULP ASSOCIATION 1878 to 1927

by

Arthur Selwyn-Brown
B. Sc., M. A., Ph.D., LL.D.

This history of the American Paper and Pulp Association has been prepared by the PAPER TRADE JOURNAL to commemorate the golden anniversary of the organization at Saratoga Springs, N. Y. in 1878. The history makes intensely interesting reading. The Association has from the beginning been fortunate in its personnel, having included numerous United States Senators, Congressmen, State Governors and men of more than usual prominence in may other walks of life who truly have "left behind them foot prints on the sands of time." The pages of the history review the endeavors of these real captains of industry to bring about various betterments in the American paper industry which could not easily be effected by individual effort. The present generation of paper makers have reason to feel proud of these founders and their successors during the past half century as they have not only built a really great and representative trade association, but have caused the paper industry to rank among the very highest of the basic industries of the country.

OFFICERS of the AMERICAN PAPER AND PULP ASSOCIATION

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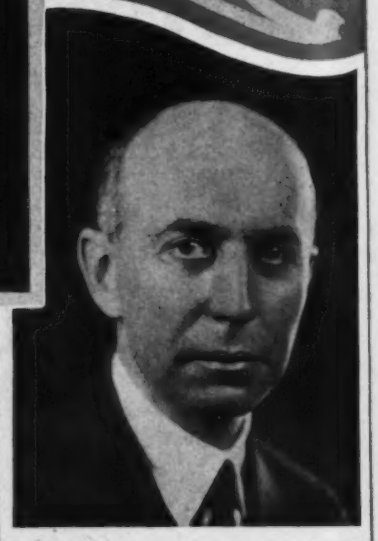
Hammermill Paper Co.

Vice-President
Alex G. Gilman
Allied Paper Mills



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Marathon Paper Mills Co.

Executive Secretary
Hugh P. Baker
18 East 41st Street, New York City

Assistant Secretary
O. M. Porter
18 East 41st Street, New York City

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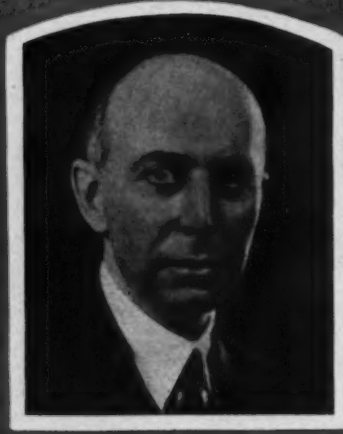
Members of American Paper and Pulp Association

EXECUTIVE COMMITTEE of the AMERICAN PAPER AND PULP ASSOCIATION

Norman R. Wilson
Hammermill Paper Co.



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History of the AMERICAN PAPER AND PULP ASSOCIATION 1878 to 1927

by

Arthur Selwyn-Brown.
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CHAPTER I.

EVERY decade during the past half century has witnessed a great, cumulative increase in the national wealth of the United States with corresponding increases in the extent, output and capacities of the industrial, manufacturing, transportation, marketing and financial agencies. These have now, in many cases, attained colossal proportions. Naturally some of these agencies have become so large that no individual is competent to manage them. The supervision of their activities must be delegated to many hands. That is the reason for the prevailing custom of operating commerce and industries by means of corporations. But even corporations are unable to meet all the managerial demands of some commercial activities and we find, in many cases, a series of corporations operating under a larger organization. The more business grows, the greater this modern method of attaining business efficiency must be resorted to.

It is the basic industries that lead in this widespread delegation of business functions on a cooperative basis as the iron, steel and metal industries generally; the textile trades; the transportation companies; the banks and insurance organizations and the paper trades. Follow up the cause, giving an impetus to the inception of any great industrial organization, and it will be found invariably that some trade or market crisis, some need for attaining better manufacturing or financial efficiency, or of attaining greater or better output capacities was the actuating cause.

The American Paper and Pulp Association was born of such a need. It is one of the oldest, most efficient and best known of the modern trade associations that are doing so much to cooperate with all the manufacturers in keeping their industries technically and financially effective. A study of its history will afford very interesting sidelights in the development of American industries during the last 50 years.

The civil war disorganized all national industries for a period of about four years. During that time, many newspapers suspended publication, and the prices of all classes of paper became very high. Very prosperous years followed the cessation of hostilities and business boomed. New paper mills were opened in a large number of states. In 1860, before the war, there were 555 paper mills operating in 24 states, including Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Pennsylvania, Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, Maryland, Virginia, Tennessee, Kentucky, Georgia, South Carolina, North Carolina and California. There were 204 mills in New England; 273 in Eastern states; 53 in the West-

ern states; 24 in the Southern states and one in California. Many of these mills were using the soda process which had been made practical in the fifties. The American Wood Paper Company, organized in 1863, utilized that process on a very large scale.

In 1869, there were 677 mills operating, with an aggregate capitalization of $34,556,-014, employing 17,910 persons as compared with a capitalization of $14,052,683, and an employment roll of 6,500 persons in 1860. In the decade, capitalization, employment and output more than doubled and foreign trade in paper products assumed larger proportions than before.

Reviewing the conditions of the industry in 1877, the PAPER TRADE JOURNAL stated that "There was a moderately fair call for all kinds of paper at the beginning of the year. The stocks were not abundant, the complaints of short water at the mills were numerous, and many of them which had been running on part time were compelled to shut down. This enforced short production served the purpose of making stocks light, and quite a demand for new goods soon sprung up and trade was fair. Taking advantage, however, of heavy spring freshets the dealers became stocked up, and soon there was an abundance of goods in the market. About May 1 the prices on fine writing, book, news, straw boards and indeed on about all kinds of papers, began to weaken, and from this time forward to the end of the year there were gradual relaxations and reductions, and prices of all goods in December were much below those in January. Several notable events during the year tended to cause the falling off. The establishment of the Writing and Straw Board Associations was for the purpose of keeping up prices, mutual protection, and the presumed benefit of all manufacturers and dealers. Abrogation of the agreement on the part of some persons caused the dissolution of both and as a consequence prices fell and the markets became unstable.

"The reissue of the Voelter patent was followed by an agreement between wood pulp manufacturers who used the process to sell at 3½ cents, but outside pressure caused a reduction to 3¼ cents. This reduced the price of news papers. For book there was a decreased demand and prices also fell off."

Mill managers found it difficult to distribute their outputs satisfactorily and to secure profitable prices. All interested in the industry felt the need of stabilizing the distribution of mill outputs and capital investments. Numerous meetings were held in various parts of the country and several plans were discussed. But there was a lack of uniformity of belief in their effectiveness and nothing of a practical nature was done.

In the early part of 1878, the straw-wrapping paper manufacturers appointed a committee to visit the mills in different parts of New York State to consult with manufacturers regarding the best means for remedying the evils resulting from over-production of the paper markets. This committee reported to a special meeting of the Straw Wrapping Paper Makers Association held in Albany on June 18, 1878, that, "They found everywhere a strong desire to reduce the amount of goods turned out, but each one seemed to think that his neighbor, and not himself, should cut down to half or three-quarters time. The large mills are generally willing that the reduction shall be made pro rata, while the smaller manufacturers assert that all should be put on a par, so that the latter might run at nearly or quite full capacity while the larger mills would not be able to run one-third time. This, of course, did not suit the owners of the larger mills, and some of them asserted that unless an amicable and fair arrangement was made equally beneficial and satisfactory to all, they would run to the full extent, and submit to such loss as might result for a time in order to crush out the smaller. The discussion lasted the greater part of the day, and the proceedings wound up by instructing the committee to devise some plan to which all can agree, and which

will accomplish the object aimed at, and report the same at a meeting to be held on July 9. The utmost good feeling and harmony prevailed during the session, and the most cordial expressions of good will were interchanged between the members at parting.

"One member remarked that appearances indicated that they would be obliged to cut down their production from want of water, as there had been very little rain in the northern and western sections of the state for some time, and in consequence the streams were very low. This would relieve the committee from a duty they would no doubt gladly be rid of, and save much ill feeling that may be engendered by a compulsory suspension at a later day."

There was much trouble in the trade, also, from complications about the sulphite patents and many meetings of mill owners were held to endeavor to secure uniform action regarding technical processes.

Plans were made for a general conference of all interests in the paper trade with regard to these and other problems that were handicapping the free development of the industry. There had been a previous conference in 1861, which succeeded in relieving the industry and many of the larger manufacturers believed that another general conference might be beneficial to all the trade. The result was the holding of the National Convention of Paper Manufacturers on August 28, 1878, at the Grand Union Hotel, Saratoga Springs, New York.

The meeting was called by the following circular:

"At a meeting of paper manufacturers held in this city on the 20th of last month, at which were represented mills engaged in the manufacture of writing, book, news and manila papers, the undersigned were appointed a committee to consider the advisability of calling a general convention of the manufacturers of the above-named classes of paper. The committee was authorized to call such convention at such time and place as might be deemed advisable. After personal conference, or correspondence, with leading paper manufacturers, the committee believes that great good may result from a full and free discussion of the condition and prospects of this branch of industry. We, therefore, in behalf of the trade generally, cordially invite and most earnestly request all manufacturers of writing, book, news and manila papers in the United States to assemble in convention at the Grand Union Hotel, Saratoga Springs, New York, on the 28th day of August inst., at 2 o'clock P. M.

"It is expected that all matters affecting the general good of the trade will be considered at the meeting, especially the question of demand and supply, and the best means of insuring stability to our business, now so seriously demoralized. We trust that you will aid this movement by your personal presence at the convention, and we solicit a reply at your earliest convenience, addressed to the Secretary of the Committee, C. O. Chapin, Springfield, Mass.

WILLIAM WHITING, D. P. CROCKER,
GEORGE E. MARSHALL, C. O. CHAPIN,
C. O. BROWN, Committee."

When the meeting assembled, W. C. Plunkett, of Massachusetts, was nominated to be president of the convention. C. O. Chapin and W. H. McClung were elected secretaries and A. E. Harding, of Ohio; William Whiting, of Massachusetts; L. C. Woodruff, of Buffalo, and Messrs. Fairchild and Nixon were appointed vice-presidents.

Mr. Harding suggested three resolutions with the object of starting a discussion on questions that were then agitating the trade. The first stated that a sense of duty and interest of all the manufacturers called them together to unite in a well-directed and organized effort to rescue the paper trade from demoralization and their mill properties from ruin.

The second resolution stated that it was

in the power of the trade to ameliorate conditions provided it worked cooperatively and without jealousy.

The third referred to the fact that it was obvious that the present demoralization in trade was due to over-production and, therefore, the trade should provide some means whereby production might be regulated automatically.

These suggestions permitted lengthy discussions being held. It was discovered that there was much sectional jealousy between mill owners. The western owners complained that while they advocated active, progressive measures being taken, the eastern manufacturers showed a disposition to await events. The question of proper mill representation by officials of the convention and by members was also difficult. Finally it was agreed by resolution that a committee of 15 members be constituted as follows: The manufacturers of writing paper shall name five members; manufacturers of book and news papers five members; the manufacturers of manila papers five members. Later on the committee recommended that objects of the convention might be met if the mill owners were to agree to run their mills five-sixths of the time monthly for six months. On motion, the convention agreed to do so.

At a session held on August 29, 1878, the convention resolved that: "The time has come when an intelligent sense of duty and interest calls upon the paper manufacturers of the country, one and all, cordially to unite in a well-directed, organized effort to rescue our business from demoralization and our mill property from ruinous depreciation.

"That by acting intelligently together we can make our business what it ought to be and place it on a basis more satisfactory and secure than it was or ever can be while we work in aimless independent rivalry with each other."

A committee of five was appointed to consider the formation of a permanent body to carry on the functions of the convention. That committee submitted the following plan for a constitution:

"ARTICLE I. This association shall be called the American Paper-Makers' Association. It shall consist of all manufacturers of paper in the United States who shall subscribe this constitution and comply with its provisions.

ARTICLE II. The officers shall be a President, whose duty it shall be to preside at all meetings of the association, two Vice-Presidents, a Secretary and a Treasurer.

ARTICLE III. There shall be five Executive Committees, of three members each, selected from the five divisions hereafter named.

ARTICLE IV. The President and two Vice-Presidents, Secretary and Treasurer shall be a Central Executive Committee, whose duties shall be to arbitrate upon all questions referred to them by the Executive Committees of the different sections, and to decide such other matters as may properly come before them, and their decision shall be final.

ARTICLE V. The headquarters of this association shall be at Springfield, Mass. This association shall hold meetings annually, to be called at such time and place as the Central Executive Committee shall determine.

ARTICLE VI. The members of this association shall be separated into five divisions, having their headquarters, respectively, at Boston, New York, Philadelphia, Cincinnati and Chicago. Members of this association shall attach themselves to such division as shall be most convenient to them.

ARTICLE VII. The officers of this association shall be chosen by ballot at each annual meeting, and shall hold their offices for one year and until their successors are elected.

ARTICLE VIII. It shall be the duty of the Executive Committee of the respective divisions to carry into effect the action of the general association, and to consider and arbitrate upon all questions and matters arising within

their respective divisions under any agreement made between members of this association.

ARTICLE IX. In all meetings of this association each mill shall be entitled to one representative and one vote.

ARTICLE X. The Central Executive Committee shall have power to make assessments upon the members of the association to pay necessary expenses, and such assessments shall be apportioned according to the production of mills represented.

ARTICLE XI. This constitution may be altered or amended at any annual meeting by a vote of two-third of the members present.

ARTICLE XII. That no officer shall hold two positions in the organization."

This constitution was unanimously adopted and the president of the convention congratulated the members on their work, upon the harmony and enthusiasm throughout the sessions and upon the fine efforts they had exerted in the interests of the future welfare of the American paper trade.

The American Paper-Makers' Association was launched in this manner amidst the cheers of the representatives of all the principal mills and jobbers.

The *New York Times* editorially commented upon the work of the convention in its issue of August 28, 1878, as follows: "The convention of manufacturers of paper, which meets at Saratoga today, is likely to be an interesting and important body. The interest which they represent has made rapid strides within the past 10 years, and, though some members of the trade complain of dull times, there would seem to be an essential vitality in the business sufficient to sustain and extend it if a proper course is pursued. Owing to improvements in the processes of manufacture, and to the energy and skill which have been devoted to the business, American paper is now in a very strong position with reference to competition in foreign markets. Its annual product is estimated at more than $75,000,000. Exports of considerable value have already begun. In quality, American paper compares favorably with foreign, as anyone can see who will take the trouble to look at English and American books printed from the same plates. This fact is indeed conceded by some of the best English publishers, who would be glad to use the finer qualities of American paper to a greater extent if the absurd tyranny of the trades-unions in England did not interfere with their doing so. It is known, too, that American paper has received cordial recognition at the Paris Exposition, and that the proportion of both gold and silver medals allotted to American houses is such as to be a matter of honest pride. Not only in the manufacture of book and writing paper, but also in the making of wall papers, and of various objects of household use, and in paper boats for rowing—in a word, in all the many branches of the trade which are comparatively new or have received new development, the ingenuity of Americans has produced remarkable results.

"One obstacle in the way of the extension of the trade to the extent which would otherwise be attained is the difficulty in obtaining the raw material, particularly rags. The export of rags is heavily taxed in France and Germany, and an effort is being made by Prince Bismarck—himself, by the way, an extensive paper manufacturer—to prohibit it altogether. Should he succeed it would add another difficulty to the extension of American trade. We do not know what may be the purposes of the gentlemen who assemble at Saratoga today but it is evident that the history of the trade in the past points to the sound policy of trying to extend the market abroad as rapidly and as far as possible. It is to be hoped that the delegates will address themselves in earnest to this task, whether the home market is overstocked or not. For the present there can be no doubt that permanent prosperity for an industry so powerful as this, and which has already made so much advance in spite of the disadvantages

with which it has had to contend, must be sought in opening up more extensive markets. The period of tutelage for most American manufacturers is past. It is not consulting either their dignity or their industry to regard them any longer as experiments, requiring temporary expedients to keep them on their feet. They have elements of essential strength which should enable them to hold their own, no matter from what quarter competition may come. We have no doubt that this fact will be appreciated by the paper manufacturers, and that they will show that confidence in their own ability and resources which their high achievements in the past justify."

The new association thus started under good auspices. The trade was favorable to it and the public applauded an organization which was felt to be needed in stabilizing one of the basic industries of the country, the products of which are necessary in every home as much as foodstuffs. The die was cast and one of the largest and most influential of modern trade associations was established.

CHAPTER II

ECONOMIC conditions that caused the American paper manufacturers to associate to stabilize the industry spread to Europe and we find, in turn, the paper manufacturers of Great Britain, France, Austria-Hungary and other countries calling conventions to find ways and means to prevent the violent fluctuations in demand and prices. Reading the discussions that took place at these conventions, it appears that the economic forces disrupting the industry were world-wide in their scope, and that the best business men in each country suggested the regulation of production to estimated consumption demands as the principal remedy. In other words, the paper manufacturers were being taught by practical experience that the paths of successful business will only be kept clear of difficult places when the production and consumption of commodities are equalized and automatically adjusted and the most effective machinery for doing that is some form of general trade supervision.

The question of finding foreign markets for the American paper surplus arose in 1879. It was proposed to form a national clearing house to receive and prepare for shipping and arranging for distribution in foreign markets where profitable demands might be found. It was known that American paper manufacturers were able to compete with British, German and French manufacturers in their own markets. The finer grades of white and manila paper found ready sales at profitable prices in all the world's markets, while Mexico, the West Indies, and Central and South America, afforded good opportunities for the disposal of straw wrapping papers.

The PAPER TRADE JOURNAL editorially commenting on an exporting plan on June 29, 1878 said:

"As to the course to be recommended to the convention and adopted by it, it further appears that the only thing which will afford immediate relief, is the entire cessation of production by all the mills for a period of at least thirty days, or during, say, the first two weeks of two successive months. We have preached this remedy—the making paper scarce—for years; and there is only one other that we can recommend—the united action of all the country. The last course may seem impracticable, but it is not necessarily so. In the charge of a competent committee, agents could easily be secured in leading cities abroad. The amount each mill should contribute to this export movement could be exactly apportioned, the goods could be consigned regularly to the committee, and by them shipped to certain localities in proper proportions to reliable agents, with

instructions to dispose of them at public auction at the best attainable price. A little study of the wants of foreign markets would soon inform the committee of the proper kinds and sizes needed for different localities; and even should such business result in heavy losses, it would get rid of our surplus and advertise American papers in all parts of the world. The surplus is not so very large, but, if it was only five per cent, it would still determine the market. We, therefore say, get rid of it, at any cost, if you cannot arrange among yourselves to stop making it."

When these plans of the American paper trade were made known abroad, they created heated debates about the dumping of foreign products in their markets and there was a general agitation for increased tariffs on imports. The acknowledged general excellence of American papers intensified the dismay of foreign manufacturers.

Meanwhile another serious problem confronted the American paper manufacturers. Trade began to revive slowly and with it there came a general rise in commodity prices. These led paper manufacturers to increase their prices. The newspapers were loud in their demands for cheaper paper. In order to show how the rise in commodity prices increased the cost of paper manufacturers, the trade pointed to these comparative figures covering the costs of materials between the years 1872 - 1880:

	1872	1873	1874	1875	1876	1877	1878	1879	1880
Bleach	4.80	3.31	2.71	2.56	1.75	1.65	1.25	1.25	2.12
Soda Ash	4.12	3.19	2.75	2.37	2.37	2.12	1.62	1.60	2.19
Porous Alum	3.37	3.37	3.37	3.37	3.31¼	3.25	3.03	2.62	2.75
Cotton Waste	3.75	3.75	2.50	2.75	2.62½	2.62½	2.00	2.00	3.50
Colored Rags	....	....	3.00	3.00	2.78	2.53	2.12½	2.00	3.50
White Rags	....	....	6.00	6.00	5.25	4.50	3.69	3.41	4.88
Wood Pulp	5.00	4.87½	4.50	4.00	4.00	3.50	3.25	3.00	4.00
Book Papers—									
Super Sized and Calendered	....	18.00	16.00	15.00	15.00	13.37	10.75	9.25	12.00
Book—Machine Finished	....	....	14.00	11.00	10.25	9.75	8.62	7.50	10.50
Common News	12.50	12.00	10.75	9.62	9.00	8.50	6.87	6.06	9.00

These statistics showed that it was not price-fixing by the paper manufacturers that was the cause of the increased prices of paper; but the general rise in commodity prices and labor. Ante-bellum commercial conditions had changed and a new order of business was being ushered in.

The price of paper was brought into prominence during the second Annual meet- of the American Paper-Makers' Association held in Saratoga Springs, New York on July 30, 1879. Mr. Harding of Middletown, Ohio, expressed these opinions: "On looking this ground over again it appears as plainly as ever to my mind that if a perfect understanding could be arrived at in regard to the regulation of the product and price of paper, the paper-makers of the country could vastly benefit themselves and each other by co-operating together in that direction.

"It is generally admitted that supply and demand essentially govern trade. That we can, by acting together, regulate the supply, and that we can by acting together, regulate prices, there is no room for doubt or question. It appears to me, however, too much to expect that manufacturers will risk their business on an uncertainty, or on a contingency, of which they have no reliable knowledge or control. I cannot but think that every manufacturer in the country would be willing to regulate the product of his mill or the price of his paper by a fair general standard, if he could only be assured that all others would do likewise. The assurance of good faith and a fair basis I believe to be essential to success in any movement of this kind.

"The prices which the country pays for its paper within the range of a fair compensation in its manufacture is of no appreciable difference to the country, and the great difficulty in the way of remunerative

prices I believe to be the fear of being undersold in the market. No manufacturer would sell his goods at less than a remunerative price, if he was not afraid of losing his business or something of that kind. Now, let it be understood with a fair degree of certainty that no one will sell a certain kind and quality of paper below a certain figure, and the great temptation to undersell that price ceases to exist.

"There can be no good reason why paper should be sold by any manufacturer at less than a fair average remuneration for his capital and labor. Suppose one man can manufacture cheaper or better than another with corresponding facilities; that can be no good reason why he should sacrifice his ability or advantages. If the cost of news print paper, the average cost, is six cents per pound, and some one discovers that by superior abilities and advantages of one kind and another he can make it at five cents, would it not be more in harmony with what is arbitrarily called common sense that he should have the benefit of that cent to himself than that it should be thrown away or made the cause of more harm than good to himself and everybody else.

"Suppose one man can make more paper than others in similar circumstances. The same ability which enables him to do that, would enable him to make the equal product of a better quality, such as would command a better price, and in that way he could obtain quite as much advantage to himself as in the other.

"If some uniform rule could be agreed upon and established for the regulation of product, in which every manufacturer could be assured of his full share and proportion of the demand, would it not be very much to the interest of all to comply with it? Most certainly it would. And if a minimum price could be fixed upon any general kind and quality of paper, would not corresponding prices on all better qualities of the same kind naturally follow? It seems to me they would.

"The reduction of cost is, of course, an important factor in manufacturing anything; but while such reduction of cost depends upon an increase of product without any corresponding increase of demand there must be a limit to the advantages that can be obtained in that direction, and whatever the advantages that can be thus obtained, they are of short duration; for as one increases product, others do the same, and all sink to a lower level together, sooner or later.

"Is there not some better way for us to take than that of constantly increasing product to reduce cost, which only multiplies the evils and drags us down lower and lower with no compensating equivalent whatsoever. Surely this hot-bed reckless production of quantity, which only leads from bad to worse, cannot be the sum total of all wisdom in that respect.

"Is there not some way for us to work that will admit of a rational respect for the ordinary responsibilities and enjoyments of life? Why should we so slavishly devote ourselves to a cause that will not yield adequate returns? There may be some other things to claim a share of our attention besides increasing product, and thereby knocking down the price of paper. I doubt if that ought to constitute the whole of our mission in life. Suppose the paper mills of the country did all shut down when night came, and that the papermakers of the country did go to bed and sleep like other people during the time appointed by nature for that purpose, who would be the worse for it? Yea, would it not be much better for all directly, or indirectly engaged in, or any way connected, with the business? Why should a man work night and day, Sundays, included, when he can do even better by himself in working week days

only, resting nights and Sundays, as all decent Christian people should do?

"With the right disposition fairly developed there ought to be no great difficulty in arriving at a fair standard by which both product and price could be regulated. Any half-dozen intelligent men, with the cardinal data before them, could soon determine what would be a fair proportion of product for every mill in the country, and with product regulated, the regulation of price becomes comparatively an easy matter.

"Suppose the meeting at Saratoga were to appoint a committee of gentlemen—say three to five—from each branch of the business, work out in detail and draw up such a practical plan for the regulation of price and product as would embrace all the conditions and influences necessary to be met or complied with, such as, being based on as nearly perfect equity as possible, would commend themselves to all well-disposed and fair-minded men. Who knows what might grow out of the appointment of such a committee? Such work cannot be done as it is necessary it should be done by a large body of gentlemen sitting in convention for a day or two.

"The members of that committee could all go to work each in his own method, to work out the result wanted; and each member having done his best on his own account they could meet together, compare and revise each other's work, and then together get up such a report as they may have been led to believe would best meet the case. The committee to call a general meeting as soon as they are ready to report, say within a month or two, at which the report could be discussed and acted upon.

"In that way we could soon find out whether there is any basis upon which we can all agree for the regulation of the product and price of paper.

"It has been said that all men are governed by what they are led to believe will be for their own interests. Let it be made plain—transparently plain—to every manufacturer in the country, that he could better promote his own interest by co-operating with others than by any independent course which he can pursue for himself and I doubt if there would be much difficulty in getting up such an organization as would become permanent and mean something."

Congressional activities regarding tariff and taxation charges threatened further difficulties for the paper trade. There had been quite a large amount of discussion in political circles about the prices of news print paper and there were threats of governmental action regarding prices. This matter was referred to in a report to the Association by General Plunkett, of Massachusetts who said, "There has been much said about the relief that may be obtained by the paper manufacturers. I know there is a difficulty about it, and yet the paper manufacturers have it all in their own hands. A year ago there was a committee chosen to see if something could not be done. The arrangement that was made at that time seems to have failed. A remark has been made that a larger quantity of paper is consumed now, and that there seems to be more demand for it than a year ago. That may be true. I don't know, but if it is true, I believe another thing is true too—that paper is lower now than it was a year ago. How is it that paper should be lower and yet the demand greater? I suppose it will be stated, as is probably true, that paper manufacturers have been underselling each other. There has been a desire to sell, and in making different kinds and qualities of paper they have undersold each other, and they have put down the price. I know very well that paper dealers in the cities, many of them, all of them that I have conversed with, are all anxious for the price of paper to be put up if it will only remain so. They don't wish to have it put up temporarily and go

down again the next month. I suppose there are two causes—one cause particularly—why we did not succeed last year. I don't know when I make this remark that it is true of any men, or set of men, in the paper manufacturing business, or connected with it at all. It has been suspected that there are certain concerns in the country that do hope, if this state of things continues long, a great many smaller concerns in the country will fail, and go out of the business, and they shall have all the business in their own hands. I have been in business some sixty years—not in the paper-manufacturing business all the time, but in other kinds of business a major part of the time—and I remember very well (and I suppose what I am going to say about another branch of business may be true of this branch) that there was a time when it was said that there were large corporations in the country in cotton manfacture who supposed they could drive all the other cotton manufacturers out, and thus have the business in their own hands by making the price very low, so that they would retire. It was true that many of the small manufacturing establishments failed on account of the price that was put upon cotton goods, but it was also true that as they failed somebody came in and bought their establishments out at a very low price and were able to go on again, so that all these manufacturing establishments went on under better auspices and advantages, and if it was true that these manufacturing concerns did anything of the kind, they came to a different conclusion. They turned right about and said 'Here, there are too many goods in the country'—Abbott Lawrence being at the head of the manufacturing interest—and they purchased all the manufactured goods of the country at a venture and sent them out of the country, and then the price rose and no attempt of that kind has been made since. If it is true, as has been suspected by some, that the large establishments in the country—some very large and able establishments—think they will drive the smaller class out, I suspect they will find that thing just as true in this as they found it in the cotton business—that these small mills will be sold to somebody else at a less price, and these will manufacture in the small establishments better and cheaper than their predecessors did. I suppose that will be found to be true, and whether or not it is true, as suspected—that they can compel men to put a price down until these small establishments retire—I suppose they will do so, but I think it will fail. There is another thing which I believe I took some notice of last year. It has transpired since, which has only confirmed my ideas then, that we have to fear what Congress may do. It is said that politics should have nothing to do with business, but I apprehend if this state of things continues to exist politics must have something to do with business, if business is to progress and to have any degree of prosperity. They have drawn a wet blanket over the business. No good is expected from it; that is beyond hope. Mr. Wood, the chairman of the Committee of Ways and Means, says next December he will bring up the tariff bill, which he hopes now to be able to carry through at the next session, although he was unable to last. He may and may not. Now we have to look at that, and, perhaps, so far as Congress is at present established, perhaps, so far as our relations to Congress today exist, we are almost helpless. What they will do we do not know. We know what the history has been of this last extra session, and we know if the country is saved from any peril how it has been saved. Therefore, I say it is important that we look to our interest in choosing members of Congress and in regard to the measures to be adopted. Our business is said to be prosperous, some have made the remark here. I see the let-

ter from Mr. Harding, saying that the business is prosperous. There is no doubt that there is a better state of things existing, but it is in spite of what has been done to hinder business. If by any means Congress could be kept away for three years, the business men of this country would go along; the country itself would work it out, and it is by means of this generous legislation, for what purpose nobody under heaven can conceive, that business suffers. but perhaps I have said enough of that and now, what can we do?

"This whole business relation is in the hands of the manufacturers, and perhaps we could not act here today and say what should be done, because there are many that are not here today, but there are two ways; they are to reduce production and therefore advance the price, or to advance the price. I don't suppose myself that the aggregate of manufacturing interests have gained one dollar in the last year. Some may have made upon specialties, but many have lost. I doubt whether there is an aggregate of as much wealth or any more wealth than there was. Shall it continue so? A suggestion was made by Mr. Harding that the committee should devise some way either to reduce production or increase price. Last year we attempted to make a reduction, but it did not seem to meet with success. It did in some of the divisions, but not everywhere. Would it be likely to meet with better success? I should think it might. I also feel favorable in regard to another thing. Something has been said here about five, or ten, or twelve per cent increase on the price of paper. Some paper has been sold at six and six and one-half cents and writing paper for nine to fourteen and fifteen cents. Five per cent increase would not be a very great matter, but I should say twelve and one-half per cent would not be an increase that would affect the public very materially, but it would affect the pockets of the manufacturers very materially, and it seems to me we had better come to that conclusion, to advance the price. I know there is a difficulty about reducing production and advancing the price. The fear is that everybody will not come into it, that some will adhere to it while a minority takes advantage of it all the time. I think there ought to be honor in the matter. If we agree to a thing we ought honorably to abide by it, let the consequences be what they may. Therefore, I would suggest that a committee be chosen to see what can be done to devise ways and means either to raise the price or reduce the production. If the paper is all wanted for public use, then raise the price. There is a good reason why it should be raised, if the paper is all wanted. And there would be no objection to raising the price, as I said before, with the paper dealers of the city. They are all ready to have the price raised and want it permanently raised. Therefore, wouldn't it be better for us to choose that committee if we cannot act here today. We might take the sense of this meeting on the subject, whether to raise the price or reduce production, and I don't believe there are any gentlemen here but who feel it would certainly be doing themselves a great benefit and doing the trade a benefit everywhere to raise the price, and nobody would feel it; the consumers around the country would hardly know it."

The Association having been in action for a year, found that the problems it had endeavored to solve continued to exist and that numerous others had arisen. The majority of members of the trade had failed to cooperate with the Association and much ill-feeling within the trade had been evidenced.

C. O. Chapin, the Association's secretary, exhibited much activity in developing sectional committee meetings. Those in Cincinnati, Chicago, Wisconsin, Ohio and Massachusetts, met often; otherwise, the

trade was quite apathetic, and when the Association sent out circulars to the trade soliciting new membership, it learned that the general sentiment was that the Association had done little to ameliorate the effects of depression and few were interested in becoming members. Some of the original members also wrote asking whether it would be advisable to continue the Association and to hold another annual meeting.

Three members of the Association, however, proved to be far-seeing optimists. General Plunkett, Mr. Harding and the secretary, Mr. Chapin, knew that the association was necessary and could be made successful if the cooperation of the trade could be secured. In the past, promises were not kept, and it was difficult to secure action. All the work of the Association had to be shouldered by one or two men while others looked on apathetically. Means must be found for securing real cooperative activities. The above-named members had clear foresight and the optimism necessary to do things, and their greatest task was to secure the confidence of the trade in the beneficial and sound economic possibilities of the Association.

CHAPTER III

THE trade depression did not prevent inventors from improving technical machinery and processes. Mills were being continually remodeled and rebuilt on a larger scale and new mill projects were being discussed.

British paper experts who had inspected all the leading mills reported, in 1880, that the outlook for the manufacture of paper was the best in the world. The features that impressed them chiefly during their visit were: (1) American paper manufacturers were alive to every practical improvement in the manufacture, and recognized the advantage of the interchange of ideas generally, with a remarkable freedom from jealousy as regards other nations as well as each other (2). they were the first to seize upon all the waste materials besides rags that can be made into paper. The success with which old printed paper is utilized makes the news sheet simply a fabric, which is soiled with the printing ink of a day's news and then goes to the washing, mangling, ironing and smoothing of a huge laundry; viz, the paper mill, (3) that in the wide, and still spreading, extent with which they are utilizing their woods and forests for paper pulp, they are conferring a world-wide benefit. Great Britain is denuding the Mediterranean shores of esparto and it is already becoming dear and scarce. She imports largely the wood pulp of Norway and Sweden, but every source is required. Here, free trade by giving the American wood-pulp maker the best form of alkali at the cheapest cost will be found a great general boon, (4) that in the ability of workers in adapting themselves to all new processes, however labor saving, of every mechanical improvement, the American trade has a form of natural protection that may be estimated at one cent per pound at least. If we add the fact that no paper can be brought over thirty-five hundred miles on a stormy sea without costly carriage and a costly process of packing, port charges, etc., which double the freight, it will be plainly evident that, even under trade as free between Europe and America as between State and State in the United States, American mills will always have an advantage over European mills.

Congress, at this time, was considering a new protective tariff which would affect all our industries and the discussions of this action had a very depressing effect upon trade generally. It caused a serious rift in the paper trade, because, while the Eastern manufacturers were in favor of a moderate tariff, the majority of the Western mill men favored free trade as the soundest means for establishing American industries, which were so fortunate in having inexhaustible reserves of raw supplies. This economic problem had a very adverse effect upon the new Association

and became a matter of grave concern to the few strong men who had taken the Association to heart.

On Septtmber 8, 1882, the Association had a committee appear before the Tariff Commission at Chicago to advocate the wishes of the American paper trade. The consensus of opinion in the trade was against an increase in tariff. This opinion was reversed in 1887.

It was shown that other American industries with raw material free, were treated with greater consideration in making up the tariff than the paper industry. Some of the European countries escape these export duties by reciprocity treaties, and all have the advantage of cheaper freight from countries exporting rags.

No demand for a reduction in the tariff had been made for years save by a few newspaper publishers, who, taking advantage of an exceptional condition of the market in the fall of 1879, for which condition the paper manufacturers were in no way responsible, clamored for free printing paper. As the duty on paper suitable for their use was but 20 per cent, an easy way out of their temporary trouble would have been to import paper; but the imports of printing paper for the year ending June 30, 1880 (which covered the rise and fall of the "boom") were but $75,936, dropping to $55,329, for the year ending June 30, 1881, and at that time, taking quality into consideration, news paper was but a shade higher in this country than the average European price, and the average standard of quality was much higher than in Europe. The foregoing shows that home competition would insure reasonable prices for home consumption, and that the outcry against the paper makers was unjust and uncalled for. Had the newspapers had their way, they would be paying higher prices for their paper, as the building of mills would have ceased and the trade been generally demoralized from threatened imports of foreign surplus paper. During the agitation of the question of the repeal or reduction of the duty on paper, agents of foreign manufacturers were offering their goods here at less than their price to home customers. A small surplus of paper thrown upon the market is sufficient to break prices to a greater degree than is possible with most other manufactured goods. The consumption of paper cannot be forced by a small reduction of price, as is the case with many other goods. No newspaper publisher will print 12,000 copies of his paper if his subscription list is but 10,000, simply because his printing paper costs him one-half or one per cent less. No book publisher will publish an edition of 5,000 copies of any book when 3,000 copies is all the market will take because paper is one cent lower in price. No person, because he can buy five sheets of note paper for a cent, instead of four sheets for a cent will increase his correspondence 25 per cent.

While the imports of printing paper, which bear the lowest rate of duty, decreased, the importations of writing paper, bearing the highest rate of duty increased. The imports of writing paper increased from $8,944 in 1877 to $40,778 in 1881—over four and a half times. These imported writing papers were mostly, if not entirely, of a high grade of paper—fancy note paper, etc.—which were in the nature of luxuries. If the duty were even higher there would still have been a demand for them, and if the duty were reduced the sale of them would scarcely have been increased. Steadiness in prices was desired by the manufacturer and his customers, but that can never be assured when frequent changes are made in legislation affecting the manufacturer, or when such changes are impending. No stability to trade and manufacture can be looked for when the market is liable to be distrubed by an influx of foreign goods imported at a low valuation and a low rate of duty.

Recognizing the desirability of steadiness and stability, the paper manufacturers of this country were content to abide by the tariff

as it was, rather than unsettle the business by asking for an increase of duty to make them on a par with other industries and at the same time they were confident that home competition would continue to furnish all the paper demanded at reasonable prices. They believed that the best interests of the country, so far as their industry was concerned, affecting both the manufacturer and his customers, would be best served by preserving the present rate of duty.

It was clear that the paper trade was most anxious to find means for stabilizing trade and it, at that time, did not favor tariff revision on account of the further difficulties such changes would cause.

New mills were springing up all over the country and others were planned. This meant larger increases in production and more troubles in providing for the distribution of surplus stocks. The new mills were using the newest machinery and technical methods and as they were covered by a multitude of patents, endless patent lawsuits were started which menanced the trade to such an extent that concerted action became necessary and threw further harassing duties upon the executive members of the Association.

The officials of the Association were kept exceedingly busy by the multitude of new problems that were rapidly arising in the trade and the majority of firms in business were still apathetic. At the fourth annual meeting held at Saratoga Springs on July 27, 1881, some members asked what good the Association had done. They were told that the Association was now engaged upon the problem of opening up new export fields for surplus paper stocks. Government subsidies to American shipping companies, particularly those trading with Latin America, were being advocated. The following resolution was carried by the Association:

RESOLVED, That the Export Committee be continued, and all the manufacturers of paper, whether members of the Association or not, are urged to respond promptly to such inquiring circulars as the committee shall submit.

RESOLVED, That it is the sense of this Association that Congress be respectfully, but most earnestly, urged to take such wise measures as may be found expedient to establish and maintain steamship lines between our own and foreign ports, especially the ports of South and Central America, that thereby the trade of these ports in our industry, now apparently waiting only the facility of quick, regular and economical conveyance, may be secured.

RESOLVED, That the Committee on Export be requested to present this action to the proper Congressional authorities.

O. H. GREENLEAF, GEORGE MARSHALL,
C. O. CHAPIN, Committee
C. C. WOOLWORTH, Sec.

Hon. Warner Miller, of Herkimer, N. Y., speaking on the resolution said, "The resolution offered by Mr. Woolworth, is to my mind the most important question today for paper makers. South of us, commencing with Mexico and running clear down through Central America and South America, there are millions upon millions of people who are all of them non-manufacturers. They manufacture little or nothing. Why should not we trade with them, by ourselves, not only for the paper makers, but also for the wooden, cotton and iron manufacturers? I believe it to be the duty of this government, through its constituted authorities at Washington, to see to it—and see to it at once—that something is done to bring this trade to us, where it naturally belongs. There is no reason why we should be compelled to send our shipments for Brazil, first to London and thence to Brazil. There is no reason why any or all of the ports of South America should not have direct and weekly communication with the United States. It calls upon our legislators and executive departments at Washington, to see that something shall be done. What it is I don't know; but the prevailing sentiment seems to be that Congress should offer what

is commonly termed a 'subsidy' to steamships. I know the word 'subsidy' has been made unpopular by the newspaper press. For me I can say I have no fears of that word and no fears of what it means. It is, perhaps, an unfortunate expression to use in that connection, but it means simply that the general government should pay liberal prices to the steamship companies for carrying the mails. When we discover what extremely liberal prices it has been paying for the carrying of the mails over the deserts of our country, it seems as though it would have been much wiser if some of these millions had been paid to the owners of American steamships for running their vessels to all the South American call ports and West India Islands. I lately paid a visit to the West India Islands, and I have been surprised to find how all the trade was controlled by England, and controlled because she is permitted direct communication with all those ports. Business always follows lines of travel, and until weekly communication with all ports in Mexico and South and Central America is established we cannot expect to control their trade, which is very large and which we should control. We know that Europe, not only England, but France and Germany, are paying large bonuses to their steamship companies for this kind of service, and the result is that the trade of those countries goes almost entirely to Europe. Some four or five years, ago, when in Germany, I took occasion to visit a large number of paper and pulp mills, and one day, I think it was at Leipzig, I discovered a new style of wrapping paper which I had never seen before, and I made inquiry and found it was made entirely of wood, and through a German friend of mine I sought admission to the mill, and when he told the proprietor I was a paper maker he at once declined to admit me into the mill, and he gave as his only reason that that mill was run entirely from Brazil, and that if he allowed a Yankee to come in and see it he would lose his Brazilian trade. But you can be sure I did not leave Germany until I knew all about that paper; and while I can make that paper better and cheaper than they can in Germany, I cannot sell it in Brazil because I cannot get it there with any kind of certainty. We must first have our own mills and communications perfect and the establishment of commercial and commission houses. If a German desires to send any kind of paper to foreign parts he has a commission house there, well known in Germany, responsible and reliable, and his goods can be consigned there. But in those ports we have no American houses at all, and must trust our goods to foreigners or send down special agents to sell them; and I believe this can only be remedied by the means I have spoken of—the establishment of regular weekly communication with all those ports. Why should we not, as Americans, control this great trade? It naturally belongs here, and the people of those countries would prefer to come to us; for, with the exception of Brazil, they are all in sympathy with us in our forms of government, and they know American goods are well and honestly made; but they cannot get them regularly and satisfactorily, and in this direction I believe help is to come to our trade not only, but to all others.

"There is no reason why our country should not be the greatest paper making country in the world. We have here, in these great forests of Maine and northern New Hampshire, stock enough for hundreds and thousands of years. The supply is perfectly unlimited. Some gentleman asked me today if we were not using up the wood; the fact is that it grows in these Northern wildernesses faster than we can utilize it. We need not, perhaps, look to Europe for an outlet; but the trade of South and Central America and Mexico we should have, and I simply say to you, as brother paper makers, that in the official position which has come to me of late I for one shall do what I can to develop our industries and trade with the entire American hemisphere."

As a result of the wide interest in the dis-

cussions on the proposed tariff changes, Howard Lockwood of the PAPER TRADE JOURNAL, was asked to prepare a technical paper on the best means for building up an American export trade in paper. At the fourth annual meeting, Mr. Lockwood read an extensive paper entitled, "How to Export American Paper." This was the first paper read before the Association.

Another problem which exercised the attention of that convention, was a proposal to increase the postal rates on merchandise samples. The convention authorized its officers to take steps to oppose that measure.

The Association's action on these and numerous other problems affecting the trade had the effect of drawing public attention to the wide field of usefulness a strong, well-organized and efficiently directed trade Association could do for the country's great basic industries.

CHAPTER IV.

EUROPEAN paper makers organized associations on the lines of the American Paper Trade Association. In Germany there had been for centuries trade corporations (zunfte) and guilds (gilde). But the great expansion of commerce in the nineteenth century called for more effective means for coping with the numerous broad problems affecting each trade and, as Leipzig had a paper makers and stationers board of trade functioning successfully for a number of years, the paper makers of Nuremberg met in convention in 1882 and formed another board of trade. This practice was followed in the other trade centers in Germany and in Austria-Hungary. These paper-trade boards of trade corresponded with the sectional committees of the American Paper Makers' Association.

The British Paper Makers' Association was the corresponding organization in England. It was constituted on similar lines and had to deal with problems of the same nature. At the meeting held in London on May 9, 1882, the annual report was read in which the principal activities were reviewed. One of the chief features was a reference to the association's relations with the Government regarding trade, and particularly foreign trade, problems. It was suggested that a permanent body, like the association, representing the whole trade, had proved itself of supreme importance in possessing information and dealing with opportunities, and trade problems, whenever they arise. The important questions relating to the association's negotiations with the British Foreign Office during the year were referred to as disclosing the fact that there could be no other way of putting before it, the trade's opinions on foreign trade problems successfully.

The fifth annual meeting of the American Paper Makers' Association was held in Saratoga Springs on July 26, 1882, and the tariff question was again the subject of much discussion. The attendance at the meeting was disappointing and a prominent speaker asserted that he had canvassed a number of members of the trade he thought should support the activities of the association and he found that they all asked: "What good can be accomplished by going to Saratoga and what do they do up there?"

Not only had the public, the newspapers and the Government to be educated in the trade matters, but it became increasingly evident that the members of the paper trade needed an intensive educational campaign to instruct them as to the usefulness and the necessity of an efficient organization to look after the general interests of the trade.

A plan to arouse interest in that matter was devised by Howard Lockwood. After some slight amendments it was adopted by the Association and sent to every manufacturer in the country in this form:

"TO THE SECRETARY OF THE AMERICAN PAPER MAKERS' ASSOCIATION:

"Dear Sir—We, the undersigned, hereby

agree to become members of the American Paper Makers' Association, and agree to control the running of our mill in accordance with the terms and conditions agreed upon by the American Paper Makers' Association, understood to be as follows:

"1. Each manufacturer to report to the secretary on the first of every month, on blank forms provided for the purpose, his view of the aspect of the trade in general, and as to whether, in his judgment, the best interests of the business require a shut-down of the mills making any particular class of paper; and if he thinks a stoppage desirable, to say how long he thinks it should last.

"2. The Secretary to report in blanks provided for the purpose to every manufacturer who subscribes to this agreement, by the 20th of each month of the number and proportion of the manufacturers who report as herein provided, and what said reports authentically represent.

"3. When it shall appear that three-fourths of the manufacturers in any one class advise a shut-down in that class, the executive committee to issue a call to each and every member of said class for such a stoppage as will correspond with the average of what is required by the monthly reports, which call is to be strictly complied with by every member of this Association in said class.

"4. No call for a shut-down to be binding unless issued by the executive committee and duly signed by both president and secretary of the Association.

"5. No shut-down to be for a less period than three consecutive days, nor longer than six consecutive days in any one month.

"6. All calls for a shut-down to be issued by the 20th of any month, and the stoppage to be within the next month succeeding that in which the call is issued.

"7. Every manufacturer to have the privilege of shutting down at his own pleasure, provided he covers the time called for within the month specified, as stated in Article V.

"8. At the expiration of every shut-down, each manufacturer to report promptly to the secretary, who shall within ten days thereafter issue a report directed to every member of the Association, showing as exactly as possible how the call for the stoppage has been complied with.

"9. Each member to contribute to the treasury of the Association one dollar per month for each machine under his control as a fund to be used exclusively for association purposes.

"10. The executive committee to employ whatever assistance may be deemed necessary to carry out the provisions of this agreement, and all expenses incurred for Association purposes to be paid from Association funds.

"11. This obligation to be binding on any class when 75 per cent of the product of such class of mills has subscribed to this agreement, due notice of which shall be sent by the secretary to each member of the class concerned as promptly as possible.

"It has been suggested that the percentage requisite to control production should be fixed by each class for itself (not to be less than 75 per cent.), and suggestions in regard to this are requested."

A copy of the constitution of the Association was also sent to the trade and their cooperation was again requested. There was a good response to these efforts.

In order to secure greater resiliency, and broaden the scope of the Association, the constitution was amended at the sixth annual Convention on July 25, 1883. The most important change was in the name which was altered to the American Paper Manufacturers' Association. The great growth in the trade made this change desirable. Another important change was the arrangement of a number of trade di-

visions. There were five entitled: the Writing Paper Manufacturers' Division; the Book, News and Colored Paper Division; the Manila Paper Division; the Board Manufacturers Division and the Straw Wrapping Paper Division. This change altered the old geographical sectional divisions and replaced them by paper grade divisions. This movement greatly strengthened the position of the Association.

The industry continued to expand rapidly. New mills were developed in many localities and old mills were enlarged and equipped with new machinery. This tended to increase the difficulties in marketing the products and gave the Association much concern in finding foreign outlets. The discussions at the annual meetings for many years centered on the problems of tariff changes and the development of foreign markets for American paper products. How successful the Association's efforts were was shown at the annual meetings held in New York in 1897 and 1898. Statistics were given showing the enormous growth of the industry since the Association was organized and the interest that was beginning to be shown by the trade in the organization. In order to stimulate that interest further so as to enlarge the scope and functions of the Association, the constitution was again amended in 1897 to permit members joining who were not actually engaged in the manufacture of paper, and to change the membership from individuals to firms. The name of the Association was also altered to the American Paper and Pulp Association so that the pulp manufacturers, who had hitherto been more interested in the sectional pulp associations, might become members of the Paper Association. This proved to be a wise step. The membership increased rapidly and in the following year the Association was enabled to broaden its labors. It decided to open a permanent office in New York City, where its affairs could be more efficiently managed, and to organize a statistical bureau, where accurate statistics needed by the paper and pulp industries might be compiled and filed. Another field of usefulness was also planned. Steps were taken to secure the services of men eminent in various special lines of work in the paper trade to prepare papers to be read at the annual meetings. Several of these had been presented at earlier meetings, but this was not done systematically and regularly.

A further important step was taken in 1915. At the Annual Meeting of the American Paper and Pulp Association, held in New York City in February, some thirty-five of the members met and formed a temporary organization for the purpose of launching a new division within the association for the consideration of questions affecting cellulose and paper chemistry, machine design, and the various branches of mechanical and chemical engineering which engage the study of mill operators. Henry E. Fletcher, of the Fletcher Paper Company, Alpena, Mich., who had been most active in the preliminary organization work, was elected temporary chairman of the meeting, with power to form a committee of five to devise a plan of operation. This committee consisted at first of the chairman and W. G. MacNaughton, of the Nekoosa-Edwards Paper Company, Port Edwards, Wis.; Charles F. Rhodes, of the International Paper Company, Glens Falls, N. Y.; Henry Obermanns, of the Hammermill Paper Company, Erie, Pa; Ernst Mahler, of the Kimberly-Clark Company, Neenah, Wis. and Prof. Ralph H. McKee, of the University of Maine, Orono, Me., who was a member by virtue of being official chemist of the association. When the office was abolished, his membership in the committee terminated.

The committee met for the first time in Chicago on April 6, under the chairmanship of Mr. Fletcher, Mr. MacNaughton

acting as secretary, when a constitution was tentatively adopted, and a sub-committee was appointed to confer with the editor of *Paper* regarding the publication of the proceedings. A committee was also named to consider the question of offering a prize or prizes for competitive essays and to submit a list of subjects.

In the meantime circular letters had been sent out to the owners of pulp and paper mills throughout the country accompanied by blanks calling for information regarding the men in charge of technical work, such as details of experience, educational training, positions held, both past and present, etc., and the replies as received were tabulated and indexed for the use of the secretary who was yet to be appointed.

A second meeting of the committee was held in Chicago, Thursday, May 6, with the president of the American Paper and Pulp Association, Frank L. Moore, of Watertown, N. Y., in the chair. After making some minor changes in the constitution and adopting the title Technical Section of the American Pulp and Paper Association as the name of the organization, Henry E. Fletcher was elected chairman of the Executive Committee, with W. G. MacNaughton and Ernst Mahler as associates.

The Technical Section, under the name of the Technical Association of the Pulp and Paper Industry, became an independent institution a year later, but has continued to operate with the parent institution. It has proved itself worthy of its parentage and has become a strong factor in the technical affairs of the industry.

Many other special associations in the industry were developed and in 1913 the Canadian Pulp and Paper Association was formed. This vigorous organization embraces about 95 per cent of the trade and has always evinced a disposition to co-operate with the American Paper and Pulp Association in all questions of mutual interest.

The war tested the value and efficiency of the Association and made it stronger than ever before. At the annual meeting in New York, Frank L. Moore, the retiring president, stated that the Association was stronger in membership, free from debt, and meeting the increased business successfully. The development of the Federal Trade Commission offered an agency for better cooperation with the Government than was possible before and the Association strengthened the good relationships already established with that body. Dr. Edward Ewing Pratt, chief of the Bureau of Foreign and Domestic Commerce, addressed the meeting on "Preparedness for Peace." He referred to the establishment of the Federal Reserve System; the creation of the Federal Trade Commission; the Government Shipping Board; and the solicitude of Tariff Commissioners to facilitate the exporting of American goods, as important aids to the industry.

The assistance given to the government during the war proved the ability of the Association to render invaluable national services in times of emergency.

CHAPTER V.

TARIFF problems have frequently had an unsettling effect upon the paper industry. One of the earliest problems brought before the American Paper and Pulp Association related to proposed tariff changes. In 1921 this matter was brought into prominence again. There was a tariff hearing before the Ways and Means Committee which considerably agitated the industry. Paper manufacturers favored protection against foreign competition while the pulp importers presented briefs against tariff changes.

The American Paper and Pulp Association came forward for the paper industry and presented an exceedingly interesting and comprehensive brief in favor of the tariff. This brief dealt with the question in

full detail section by section, covering all kinds of paper. These various sections were presented to the committee by manufacturers and specialists in the particular kind of paper being discussed at each hearing. Individual paper manufacturers were heard and prominent editors and publishers testified as to the news print situation. This effective work was handled with great skill by the Association and it stands as an excellent illustration of the power it can exert when great national problems affecting the paper industry arise.

In furthering its stand respecting the tariff, the Association, in connection with the Salesmen's Association, was instrumental in forming the Import Committee of the American Paper Industry—a committee which is doing commendable work in protecting American paper manufacturers from abuses arising out of the importation of paper.

Because of the permanent nature of the industry it represents, the Association was one of the first of those representing the great primary wood using industries to appreciate the importance of keeping our forest land continuously productive. When our forefathers first began the development of this country the forests of America were the finest in the world. No other continent within the memory of man has been so blessed with forests as America. This very abundance caused us to become careless with it, and the years—almost centuries—of carelessness cannot be overcome with the aggressive agitation of a single decade.

The Association has approached the problem of continuous supplies of cheap pulpwood from two angles; one, the public aspect depending on legislation for adequate fire protection, proper methods of forest taxation, forest research, etc.; the other, the private aspect of aiding its members to manage their own timberlands for the profitable production of continuous crops of pulpwood.

The Association has been represented on the National Forestry Program Committee since its inception, cooperating in this way with the American Newspaper Publishers Association, and numerous other interests and organizations to secure effective government action. It was a strong supporter of the Clarke-McNary Act—our basic federal forest legislation—and has continuously supported adequate appropriations to make this act effective.

It has been influential directly and through its individual members in securing advanced legislation on fire protection, taxation and other forest problems which are largely a matter of state regulation.

At the present time the Association is devoting much of its time to the study of problems of forest research which must be effectively met if the industry is to have adequate supplies of low priced raw material and is to utilize these supplies in the most efficient and cheapest manner. It has given particular support to the work of the Forest Products Laboratory at Madison, Wis., to the various forest experiment stations, and at the present time is co-operating with other agencies in an effort to secure the enactment by Congress of basic forest research legislation.

Through the Woodlands Section, a special affiliated body organized in 1921, the Association is serving its members directly in the development of practical forest management for the continuous production of pulpwood in this country.

The Woodlands Section maintains the closest contact with the United States Forest Service and with other federal and state agencies engaged in forestry work and the value of its services to the whole industry is being increasingly recognized.

Another important affiliated organization which has done much to assist in the bene-

ficial activities of the American Paper and Pulp Association is the American Paper and Pulp Mill Superintendents Association. As its name suggests, it comprises in its membership the superintendents of production in our paper mills who are endeavoring to advance the industry through increased knowledge of their work, of the properties of their raw materials and in the encouragement of applied science in paper making.

The Association, as a result of an aggressive membership campaign, has succeeded in increasing its membership so as to enable it effectively to represent the entire paper industry. It is recognized as the representative organization of the industry not only by the Government, but also by such organizations of business men as the National Industrial Conference Board, the United States Chamber of Commerce, the Canadian Pulp and Paper Association, the corresponding European organizations and by foreign governments.

The position of the Association in Washington and other capitals has been placed upon a firm basis by its careful co-operation with the Department of Commerce and other efficient governmental agencies.

Direct mill memberships and affiliated association memberships have greatly assisted in the financial strengthening of the Association and also in cementing the good ties existing between it and the numerous other organizations in the industry. Unity of interests in many problems causes these organizations to do splendid team work whenever problems arise in which they have mutual interests. Friendly contacts are kept between committees established to maintain co-operative accord between the Association and other American, Canadian and foreign organizations. This enables the Association to exercise a world-wide influence in the paper and allied industries.

The Association has to its credit the establishment of the Paper Division of the Department of Commerce as a direct result of its well-planned efforts. This is another means through which it may exert a world influence. Such influences become of considerable importance in emergencies calling for quick and effective representation in question of supplies of coal, rosin, casein, etc., and when problems of an international character arise.

The ever present difficulty of foreign credits, markets and statistics, are efficiently handled by the Association and its statistical bureau is one of the most valuable to its members and the trade. Its aggressive Committee on New Uses is always on the alert in developing new markets for paper and paper products at home and abroad, and in assisting in the use of new types of paper products.

Few people realize the wide uses to which paper is being put in the manufacture of other products. It is now being extensively used in the manufacture of cloths, rugs, and articles of furniture, for automobile hoods, bottles, cups, raincoats, buckets, pails and barrels. Waterproof paper bags, vests for fishermen and hunters, aprons, bathers' slippers and a multitude of novelties is a comparatively recent development of paper usefulness. It has outstripped both shingles and sheet steel as a roofing material. Artificial leather, made from paper, is being used to a surprising extent. Trunks and suit cases are made from it; more and more it is being used as a building material; and it is even made into pipe lines. It is used for surgical dressings and from it are made sponges, cuspidors, egg carriers, insulators, flower pots, lead pencils, matches and thousands of other articles of every-day use.

During the war, paper was even used for clothing and shoes. Nor is this all. If the field were extended but a little so as to take in products made from cellulose, it would increase the list of uses many

fold. Photography would be impossible without it, and it is the basis of the entire artificial silk industry. At present only silk threads are made from cellulose, but it will probably be possible before many years to make entire fabrics, without the necessity of weaving, more marvelous and beautiful than the world has ever seen before. No wonder the paper industry, with its closely allied interests, is the sixth largest in the country and that it is constantly growing.

The mere enumeration of these articles of paper indicate the great fields manufacturers of paper have for future cultivation and the Association has for new branches of industrial service.

As a result of the Association's persistent efforts in bringing before the industry the many beneficial results of organized scientific research, authorization has been secured for the institution of a Department of Research in the Association. Funds are being secured and it is hoped that an engineer will soon be employed upon the effects of stream pollution and waste recoveries.

Facilities are afforded by the Association's offices in New York and the efforts of its capable office staff, not only for an information bureau where statistics, trade, tariff, technical matter and other valuable information may be secured by members and the public, but also for group meetings, conferences, conventions and other means for bringing together representatives of the entire paper industry for the consideration of common and special problems.

The history of the Association has been one long and interesting evolution of trade and national usefulness. The organization has served the industry well and effectively, it has grown in importance with the great growth of the industry, adding each year to its own prestige and offering to the industry more extensive and valuable services. Now that it has attained its fiftieth anniversary, the officers and members can look back on its record with admiration for its many valuable achievements, and they may equally look forward for even greater triumphs and successes in the future. The Association is more resourcefully equipped than ever effectively to serve all the requirements of the great and important industry it represents so splendidly.

SOME OUTSTANDING WORKERS OF THE ASSOCIATION

AT this period of the Golden Jubilee of the American Paper and Pulp Association, a splendid opportunity presents itself to recall some of our great pioneer paper-makers and outstanding members of the asociation. It is impossible to refer to the whole vast army of them. We will just briefly sketch some of the more typical members' careers in the hope that they will serve to recall those of many others.

William Whiting

William Whiting, the first president of the Association and president of the Whiting Paper Company, died in Holyoke, January 9, 1911, in his seventieth year. He had been prominent in Republican politics, and served for six years in Congress, and was a Massachusetts delegate to several national conventions, and was also active in many financial institutions and philanthropic works. Mr. Whiting was born in Dudley, Mass., March 24, 1841, and at the age of eighteen began his business career as bookkeper for the Holyoke Paper Company. His next change was to become business agent for the Hampden Paper Company, which position he resigned after three months to buy the property now known as Whiting's No. 1 Mill. Growth was so rapid that, in 1865, Mr. Whiting organized the Whiting Paper Company, with a capital of $100,000 which later increased to $300,000. Of Mr. Whiting's practical philanthropy Holyoke has had many welcome examples. The City Hospital, the Public Library, the House of Providence Hospital, and many benevolent, charitable and educational institutions and organizations benefited to a large extent from his generous giving.

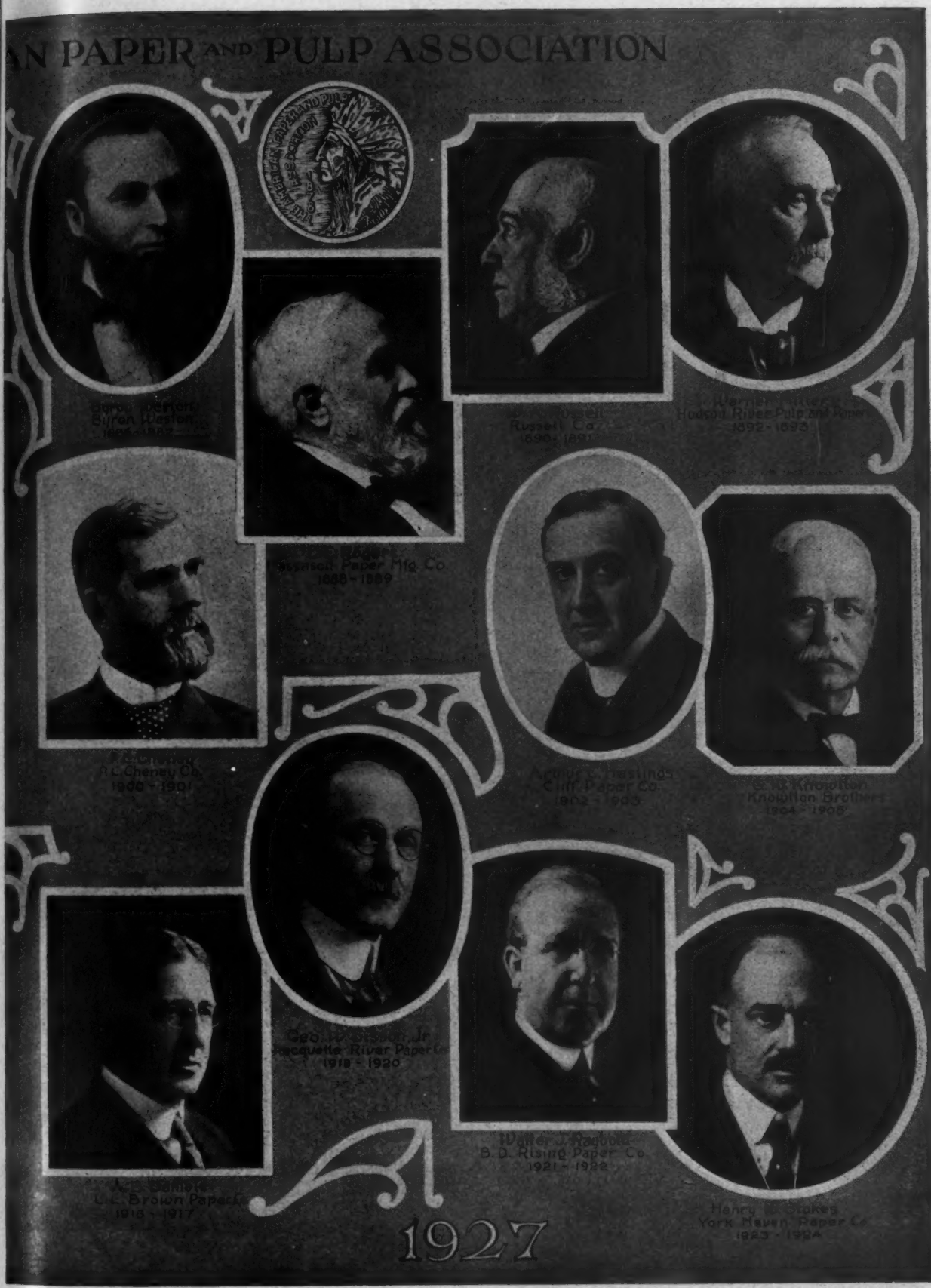
Wellington Smith

Willington Smith, the second president of the Association and treasurer of the Smith Paper Company, of Lee, Mass., died on April 27, 1910. He was born in Lee, Mass., December 15, 1841. Mr. Smith's life work was in the development of the Smith Paper Company, whose chain of mills in Lee was one of the greatest industries in western Massachusetts. Of this company, Mr. Smith was treasurer for more than forty years. He was president for some years also of the Derby Mills Company, in Shelton, Conn. He was also president of the Greylock Mills Cotton Company and had been a member of the board of the Berkshire Life Insurance Company. Mr. Smith was the first paper manufacturer in America to introduce wood pulp into his mill and use it as a b asis of paper making.

Joseph W. French

Joseph W. French, the third president of the Association, and president of the French Paper Company, Niles, Mich., died March 26, 1907. Mr. French was nearly seevnty-four years of age, having been born in Connecticut June 4, 1833. He went to Three Rivers, Mich., in 1854. In that year he took an interest in the Three Rivers Paper Company. In 1885 he became sole owner of the plant and continued to operate it until 1904 when he disposed of the property to the Sheffield Car Company and the Eddy Paper Company. In 1872, Mr. French, with J. B. and W. S. Millard, established a ground wood pulp mill at Niles, Mich., which was the beginning of the French Paper Company. It was the first institution of its kind west of the Alleghenies. Other paper making enterprises that enlisted his interest were the Marinette and Menominee Paper Company, of Marinette, Wis., and the Tippecanoe Paper Company, of Monticello, Ind. He sold his holdings in these two concerns in 1885. Mr. French was a dele-

EX-PRESIDENTS of the AMERIC
William Whiting
Whiting Paper Company
1878 - 1879
Wellington Smith
Smith Paper Co.
1880 - 1881
J.W. French, Mfg. Co
1882 - 1883
1878


AN PAPER AND PULP ASSOCIATION
Russell Co.
1890 - 1891
1927

gate to the national Republican convention that nominated Garfield in 1880.

William H. Parsons

William H. Parsons, the fourth president of the Association, died February 17, 1905, at Palm Beach, Fla. He was born on Staten Island, July 7, 1831, his father being Edward Lamb Parsons, a member of an old English family, and his mother a daughter of Ebenezer Clark who came of a well known New England family. He was educated at Rye, N. Y., and began his business life as a clerk in a shipping office. Mr. Parsons as greatly interested in paper and pulp manufacturing and held controlling interests in the Bowdoin Paper Manufacturing Company, Brunswick, Me.; the Lisbon Falls Fibre Company, Lisbon Falls, Me.; and the Pejepscot Paper Company, Pejepscot, Me., which interest, together with that in W. H. Parsons & Co. he sold in December, 1904 to David S. Cowles, his son-in-law and F. C. Whitehouse. Mr. Parsons, when the sulphite industry was being established in this country, was a stockholder and director in the American Sulphite Fibre Company, and after making a tour of investigation through the sulphite mills abroad, organized the Barclay Fibre Company, which built a mill at Saugerties, N. Y. He was a liberal contributor to church and charitable work and was in every way a public spirited citizen.

Byron Weston

Hon. Byron Weston, the fifth president of the Association, founded the Byron Weston Company. He died at his home in Dalton, Mass., November 8, 1898. Byron Weston was born in Dalton, Mass., April 9, 1831, and was educated at Williston Seminary and at Beloit, Wis. Mr. Weston's whole life, with the exception of the time when he served his country in the field, was devoted to the art of paper making. Mr. Weston was Lieutenant-Governor of Massachusetts from 1880 to 1883 and served in many offices of trust. He was also vice-president of the Third National Bank and a trustee of the Berkshire Life Insurance Company and of the Berkshire Savings Bank, of Pittsfield. He received the degress of master of arts from Williams College.

Edward Covell Rogers

Edward C. Rogers, the sixth president of the Association, died April 13, 1925. He was born at Ogden, N. Y., May 6, 1838. He was educated in public schools located severally at Ogden, N. Y., at Alpine and Grand Rapids, Mich., and Springfield, Mass. He left the Springfield High School in the early part of 1859 to become a clerk in the store of the Greenleaf & Taylor Manufacturing Company of Springfield. That concern was organized in 1853 for the purpose of making and selling paper. In 1868, Mr. Rogers was chosen its treasurer and manager. Two years later the firm name was changed to the Massasoit Paper Manufacturing Company. On January 1, 1888, Mr. Rogers became president and treasurer of the Massasoit Paper Company which was absorbed in 1899 by the American Writing Paper Company. He was a member for three years of the Springfield city council and was also president of the common council. Besides his official connection with the Massasoit Paper Company, he was president of the Chester Paper Company, of Huntington, Mass., a director of the John Hancock National Bank, at Springfield and of the Springfield Electric Light Company.

William A. Russell

Hon. Wiliam A. Russell, the seventh president of the Association and president of the International Paper Company died January 10, 1899. He was born in Wells River, Orange County, Vt., April 22, 1831. He began work in his father's paper mill in 1848, and remained there until 1851. The father and son entered into a partnership in 1853 and moved their works to Lawrence, Mass. His father was compelled to retire from active business on account of ill health, and the son took the entire business into his hands. The latter proved equal to the task, and began to

meet the growing demands of the business by leasing in 1856 two mills in Belfast, Me. In 1861 he purchased a mill in Lawrence of a firm that failed and later two other mills fell into his hands. After devoting much study and expenditure to the matter, he determined that wood pulp was the future fiber for the manufacture of paper, and he established a pulp mill in Franklin, N. H., in 1869. He began to convert the product of his pulp mills into paper by the purchase, in 1869, of the Fisher & Aiken and Daniels mills, Franklin. He also erected one the same year in Bellows Falls, Vt. Mr. Russell's principal works were there and at Lawrence. He had also large interests in other mills, at several points in Maine, and at St. Anthony Falls, Minn. He was elected a member of the Forty-Sixth, Forty-seventh and Forty-eighth Congress from the Seventh Massachusetts District. In 1894, he began to effect a consolidation of the news print mills of the country. The outcome of the effort was the organization of the International Paper Company, with Mr. Russell as president and director. In November, 1894, he broke down from overwork and thereafter took no active part in business.

Hon. Warner Miller

Hon. Warner Miller, the eighth president of the Association, former United States Senator from New York, and long prominently connected with the paper industry, died March 21, 1918, aged eighty years. For twenty-five years prior to the early nineties he had been prominent in Republican State politics, but his power and prestige as a leader waned and he dropped out of public affairs. He was born in Hannibal, Oswego County, N. Y., August 12, 1838, and was graduated from Union College in 1860. When the war began he enlisted as volunteer in the Fifth New York Cavalry. He began his military career as a private, but rapidly advanced, and for his meritorious service was soon made lieutenant. He was wounded and taken prisoner at the battle of Winchester, but later was paroled and ordered home on account of his broken health. At the close of the war he established himself as a paper manufacturer at Herkimer, N. Y. He invented machinery which revolutionized the manufacture of pulp, and became widely known as "Wood Pulp Miller." He was elected to the Assembly in 1870, and again 1874. He served one term and part of another in the House of Representatives, leaving the lower branch of Congress to succeed Platt in the United States Senate, after Platt and Conkling had resigned from that body. This was in 1881, when Mr. Miller was at the zenith of his power. Mr. Miller was a delegate at large to the Republican National Convention in Minneapolis in 1888, and placed James G. Blaine's name before the Convention. At the time of his death, Mr. Miller was president of the Sugar Cane By-Products Company, which has just begun the manufacture of pulp from bagasse at New Iberia, La.

Col. August G. Paine

Colonel Augustus G. Paine, the ninth presidnt of the Association and president of the New York and Pennsylvania Company, died March 26, 1915. He was born on January 15, 1839, at Brownfield, Oxford County, Me., and received his education in the schools of Portland. Col. Paine's early business life was spent in the dry goods jobbing business. Prior to his retirement from this line he invested in a soda fiber plant at Jackson, Mich., which later became known as the Jackson Pulp Company. He introduced many improvements, among them the Yaryan evaporators, which revolutionized the soda fiber industry. He secured control of the Yaryan apparatus and established a branch at Glasgow, Scotland. In 1890, Colonel Paine founded the New York and Pennsylvania Company, buying the Lock Haven and Johnsonburg plants, and adjacent property at Johnsonburg, Pa. The company had its own coal, natural gas and wood. Mr. Paine was wrapt up in the work of this concern and was active in its management almost

to the time of his death. Among his other activities Colonel Paine was instrumental in founding the Colorado Smelting Company. He was president of the Electrolytic Company, vice-president and director of the Columbia-Knickerbocker Trust Company, trustee of the New York Life Insurance Company, president of the Armstrong Real Estate Improvement Company, of the Johnsonburg National Bank, the Hanover Land and Dock Company and of the Highland Paper Company.

George F. Perkins

George F. Perkins, the tenth president of the Association died on Monday, January 3, 1916, aged eighty years. He was born at Andover, Conn. When quite a young lad he began an apprenticeship with the machinery manufacturing concern of Tanner & Perkins, of Lee, Mass., of which firm his father was a partner. That firm made a specialty of paper mill machinery. In due time young Perkins became a journeyman machinist. In the fall of 1858 he began his career in the paper trade with the old paper and paper mill supply house of H. C. & M. Hulbert of New York City. In 1863, he entered the employ of Coe S. Buchanan, who at that time had desk room in a building on Beekman street, New York, later occupied by Clement & Stockwell. On January 1, 1865 the firm of Buchanan, Perkins & Goodwin began business and on September 1, 1869, Mr. Buchanan retired from the firm and the firm style became Perkins & Goodwin. On the outbreak of the Civil War, Mr. Perkins volunteered his services and served with the Twenty-second New York regiment, later receiving an honorable discharge. Mr. Perkins retired from the paper business in 1903, and devoted himself to his banking interests in Jersey City.

Hugh J. Chisholm

Hugh J. Chisholm, the eleventh president of the Association died July 8, 1912, aged sixty-six years. Mr. Chisholm was born at Niagara-on-the-Lake, Canada, May 2, 1847. He attended school until thirteen years of age, and in 1860 began business life as a newsboy on the Grand Trunk Railroad, between Toronto and Detroit. By judicious saving he accumulated the sum of $50, which enabled him to take a course of study in Bryant and Stratton's business college at Toronto. In 1880 he became interested in the wood pulp and paper business. Among his early successful enterprises were the formation of the Umbagog Pulp Company, the Otis Falls Pulp Company and the Rumford Falls Power Company. He was active in the formation of the International Paper Company, established January 28, 1898, and after the death of W. A. Russell, in the fall of the same year, he became president of the company. For five years he remained in the executive seat. He was later chairman of the board of directors and resigned from the directorate after serving about three years. In 1901, he founded the Oxford Paper Company at Rumford Falls, Me., and held the presidency of that company until his death. The last of his achievements was the founding of the Rumford Mechanics Institute, which was dedicated on November 9, 1911.

Person Colby Cheney

Hon. P. C. Cheney, the twelfth president of the Association and president of the P. C. Cheney Company, died June 19, 1901 at Manchester, N. H. He was born in Holderness, N. H., February 25, 1828. His father was a paper maker, owning mills at Holderness and at Petersborough, to which latter place, Mr. Cheney's parents moved when he was a boy. When Mr. Cheney was eighteen years of age he took charge of the Petersborough mill, then owned by his uncle, A. P. Morrison. In 1853 he, with others, started another mill at Petersborough, but Mr. Cheney bought out his partners and continued the business alone. In 1866 he in partnership with F. L. Thorpe established mills at Goffstown and Amoskeag. In 1878, Mr. Cheney became

the sole owner of the plants, and in the same year the P. C. Cheney Company succeeded to the business, Mr. Cheney being the largest stockholder in the company, which operated mills at Manchester and Easton Tilton, N. H. Mr. Cheney was also president of the Excelsior Fibre Company, manufacturers of trunk and leather board at Grasmere, N. H. He was also interested in timber, indurated fiber, railroad waste, fire insurance, electric lights and other lines of business. Mr. Cheney took an active part in public life. In 1853-54 he was a member of the New Hampshire Legislature. During the Civil War he served for a time as a quartermaster, but was compelled to retire on account of ill health. He was a State railroad commissioner from 1864 to 1867, and in 1871 was elected mayor of Manchester. In 1875 he was elected Governor of New Hampshire, and served two consecutive terms. He was appointed to fill the unexpired term of Austin F. Pike in the United States Senate in the Forty-ninth Congress, and in 1892 received the appointment of Minister to Switzerland, a position which he held for three years. Dartmouth College gave him the degree of A. M. in 1876.

Arthur C. Hastings

Arthur C. Hastings, the thirteenth and seventeenth president of the Association was born in Brooklyn, N. Y., on July 13, 1860. When 16 years of age, his father died and he went to live with his uncle who owned the Rochester Paper Company's mills. He began his studies in paper making in the plant at the Lower Falls. That mill, in 1876, was the second largest in the United States. It had four machines and an output of between 12 and and 15 tons per day. He designed, constructed and put into operation the Cliff Paper Company's plant at Niagara Falls. This was the finest and most up to date of its time and one of the first to produce news print from all wood fiber. The whole mill was electrified even to an electric boiler to be used in event of coal shortage. This mill was the first in speed electric drive and the use of magazine grinders as well as the use of Niagara water under high head. These early experiences taught Mr. Hastings the importance of a thorough scientific and engineering training for paper manufacturers which he has always staunchly advocated. Mr. Hastings served the city of Niagara Falls as Police Commissioner, Fire Commissioner, Mayor and was Niagara County Treasurer. He was a delegate to the Philadelphia Convention nominating McKinley and Roosevelt and an elector on this ticket for New York State; and was director and vice-president of Power City Bank. At the request of New York bankers, Mr. Hastings became president of the American Writing Paper Company and after four years of hard work left the company in splendid financial condition (1913-1917). Mr. Hastings was president of the Holyke Chamber of Commerce for two years, and was a member of the firm of H. G. Craig & Co. in 1920-1924. He retired in 1924 except as to connection with the Cliff Paper Company of which he is general manager.

George W. Knowlton

George W. Knowlton, the fourteenth president of the Association is president of Knowlton Brothers of Watertown, N. Y. and is widely known as the dean of American paper manufacturers. Mr. Knowlton began his career in the paper business in the finishing room at $1.50 per week and learned all the successive stages of the business. Finally, he and his brother engaged in the manufacture of paper for themselves which business resulted in the present concern of Knowlton Brothers. Mr. Knowlton was prominently connected with the construction of the Ontario mill—a two machine mill sold to the International Paper Company in 1898; the St. Regis Paper Company, a four machine mill now being operated by the Northern New York Utilities Company; the Carlisle interests of Watertown and New York City, and other plants. Mr. Knowlton has known toil and

sorrow and has lived more than the proverbial three score years and ten. In looking backwards over the many years he was associated with the American paper industry, he recalls many names and familiar faces that appear no more. He knows that his own darkening shadow is now looming up toward the east and the faces of newcomers and strangers are increasing around him. But he may feel content when he realizes that his name and work will not be forgotten by the American Paper and Pulp Association and by the paper industry. They are beneficiaries of his labors and good deeds, in the nature of things, survive the doer.

Winford N. Caldwell

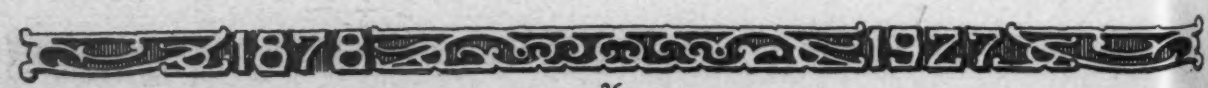
Winford N. Caldwell, the fifteenth president of the Association died at Springfield, Mass., January 11, 1927. He was born in Springfield on July 26, 1857. He attended the local schools and at the age of 15, after one year in the high school, secured the position of office and errand boy at the savings bank of which he was president at the time of his death, the Springfield Institution for Savings. When 24 be became bookkeeper for the Riverside Paper Company at Holyoke, but in six months he went on the road as a salesman. He traveled for the company until 1892, when the corporation increased its capital stock, built a new mill and elected Mr. Caldwell treasurer and director. He went in 1899 from his managerial duties at the Riverdale Company to the American Writing Paper Company with which the Riverside Company was then consolidated. He first served as its general manager, and became head of the company in 1907, remaining in that capacity until 1914, when because of ill-health, he resigned and became chairman of the board of directors. He was forced to resign from that position also in 1916 because of continued ill-health.

David Smith Cowles

David Smith Cowles, sixteenth president of the Association and president of W. H. Parsons & Co., died November 6, 1911, at Rye, N. Y. He was born in Northampton, Mass., December 25, 1857. At sixteen he started to become a banker. For five years he was with Morton, Bliss & Co., Levi P. Morton's firm then he entered the service of the Standard Oil Company and remained for fifteen years. He was made a director of the Consolidated Tank Line Company, the Water-Pierce Company, the P. C. Hanford Oil Company and the Anglo-American Oil Company, a member of the domestic trade committee of the Standard Oil Company and president of the Standard Oil Company of Minnesota. He resigned from the oil company in 1902, retaining his stock, and became a partner of W. H. Parsons in the paper business. Later associating himself with Francis C. Whitehouse of Maine, he got a controlling interest in the Bowdoin Paper Manufacturing Company, Brunswick, Me., the Lisbon Falls Fibre Company, Brunswick, Me., the Pejepscot Paper Company, Brunswick, Me., the Bay Shore Lumber Company and the Sagadahoc Towing Company. Mr. Cowles was a Republican and was a delegate to the State convention which nominated Theodore Roosevelt for Governor.

Frank L. Moore

Frank L. Moore, the eighteenth president of the Association and president of the Westfield River Paper Comany, Inc., Russell, Mass., died in New York, January 6, 1926. He was born at Shoreham, Vt., in 1867. He was a graduate of the University of Vermont. In 1890 he entered the employ of the Ticonderoga Pulp and Paper Company, later going to the C. R. Remington & Son Company, Watertown, N. Y. After that company amalgamated with the International Paper Company, Mr. Moore was cashier and later superintendent of the Watertown division until 1900. In that year he organized the Raymondville Paper Company at Raymondville, N. Y. and was treasurer and general manager until 1907. He sold his interest and became president of the Newton Falls Paper Com-



pany until 1920, when the mills were sold to the United Publishers' Corporation, of the McGray-Hill Company, of New York. He then traveled throughout the country doing appraisal work on mills. In 1924 he bought the Westfield River Paper Company at Russell. At the time of his death he was a director of the Jefferson County National Bank of Watertown, N. Y., and of the Pine Waste Products, Inc., of New York. For two years Mr. Moore was president of the Watertown Chamber of Commerce. He was president of the Empire State Forest Products Association and while in that position had considerable to do with the passage of the Standard Forestry bill.

Arthur Burdette Daniels

Arthur Burdette Daniels, the nineteenth president of the Association and president of the L. L. Brown Company was born at Ashfield, Mass., October 21, 1861. In 1878 he entered the employ of the L. L. Brown Paper Company. He became treasurer and general manager of the company in 1892 and president in 1919. Among the public organizations he has given substantial service to are the Home Market Club of Boston, Mass., of which he is vice-president; the Greylock Reservation Commission, of which he is a commissioner; and the Plunkett Memorial Hospital, of which he is a trustee. He is president and director of the L. L. Brown Paper Company, Adams, Mass.; vice-president and director of the Greylock National Bank, Adams, Mass.; director Hoosac Cotton Mills, North Adams, Mass.; director American Paper Exports Inc., New York; director American Investments Securities Company, Boston, Mass.; director Columbian National Life Insurance Company, Boston, and director Berkshire Life Insurance Company, Pittsfield, Mass. He was an incorporator, vice-president, treasurer and later president, of the Knickerbocker Portland Cement Company, now one of the plants of the International Cement Corporation, and is a former president of the Writing Paper Manufacturers Association. Tested by all the accepted rules the life of Mr. Daniels has been full of good and useful service.

George Wing Sisson, Jr.

George Wing Sisson, Jr., the twentieth president of the American Paper and Pulp Association, is acknowledged by the members to be one of the foremost of our paper experts. He was born at Potsdam, N. Y. and early in life he became associated with the paper industry. He is the president of the Racquette River Paper Company; director A. Sherman Lumber Company, Potsdam; was president of the New York State Breeders Association, 1908-11; president New York State Agricultural Society 1911-13; vice-president American Jersey Cattle Club; president Northern New York Development League 1916-19; director American Forestry Association in 1922; president Empire State Forest Products Association in 1924-26; member of North eastern Forest Research Council. Mr. Sisson is not only eminent as an authority on paper, lumber and forestry, but also on farming and dairy cattle. He lives on a six hundred acre farm estate on the northern slope of the Adirondack foothills where for nearly forty years he has carried on successfully the breeding and development of Jersey cattle, Belgian draft horses and sheep. He is known internationally for his work with Jersey cattle and has served as judge at many national and international shows.

Walter J. Raybold

Walter J. Raybold, the twenty-first president of the Association is vice-president and treasurer of the B. D. Rising Paper Company Housatonic, Mass. The B. D. Rising Paper Company was organized in 1899 and Mr. Raybold was invited to join its forces. He has since been an important factor in the great success of the company. Possessing a complete knowledge,

based upon long and sound experience, of the American paper industry, its problems and the leading workers in the industry, Mr. Raybold has been called upon to render manifold services to the industry. He was president of the Writing Paper Association for two years; and he is now serving as vice-chairman of the General Board of the National Council of the Y. M. C. A.; director of the Berkshire Life Insurance Company, Pittsfield, Mass.; director of the American Paper Exports Company, N. Y., and of other important organizations.

Henry W. Stokes

Henry W. Stokes, the twenty-second president of the Association is president of the York Haven Paper Company of Philadelphia, a subsidiary of the Continental Paper & Bag Mills Corporation. He was born in Germantown, Philadelphia, on June 24, 1867. He graduated from Haverford College in 1887. Entering the employment of the York Haven Paper Company as treasurer in 1889, he gradually advanced until he became president. Mr. Stokes has always taken a keen interest in the welfare of the paper industry and in the work of the American Paper and Pulp Association. His philanthropic services are numerous and important and he is a strong upholder of American political and social ideals. Among his charitable activities may be classed his trusteeship of his Alma Mater, Haverford College and his presidency of the Rush Hospital for Consumption, Philadelphia.

Norman W. Wilson

Norman W. Wilson, the twenty-third president of the Association, was born January 31, 1885 at Erie, Pa. All Mr. Wilson's life has been spent in the paper making business. He was first employed at the plant of the Hammermill Paper Company, November 9, 1901, working first in the mill and being successively promoted to the positions of assistant manager of sales in 1910; manager of sales in 1913 and vice president in 1914, which position he holds at present. With E. H. Naylor, secretary of the Writing Paper Manufacturers Association, Mr. Wilson helped establish the Sulphite Bond Division in 1915, of which Division he was chairman during the first five years of its existence. He was elected president of the Writing Paper Manufacturers Association in 1921 and served for three terms, 1921, 1922 and 1923 in this position. He was elected vice president of the American Paper and Pulp Association in 1921, serving in this position for five years, at the end of which period he was elected president of the Association, serving two terms. The Association during Mr. Wilson's presidency not only has grown considerably in numbers, but has attained the highest point of its usefulness to the industry.

Howard Lockwood

Older than the association and just as enthusiastically devoted to the industry, The Paper Trade Journal, founded by Howard Lockwood, one of the founders and most active members of the association, has been a powerful force in its development. Howard Lockwood, of the firm of Howard Lockwood & Co., printers and publishers, and founder of The Paper Trade Journal, died at New York, November 4, 1892. Mr. Lockwood was born at White Plains, Westchester County, New York, March 9, 1846. Believing that the paper business required a newspaper to represent its constantly developing energies, he established, in 1872, The Paper Trade Journal, from which grew the large business known as the Lockwood Press, and which served as the foundation of several other successful trade papers, including Lockwood's Directory of the Paper and Allied Trades, which became a standard annual. He was also one of the founders and, in the early, critical days, one of the most active and efficient members of the American Paper and Pulp Association. The early records of the Association are full of eulogistic refer-

ences to his good work and he honored the Association by preparing and reading before it the first of its technical papers, which dealt with paper statistics.

General William Charles Plunkett

General William Charles Plunkett, ably seconded by A. F. Harding, and the very competent secretary, Charles O. Chapin, did heroic service in the early days of the Association. Innumerable difficulties had to be overcome. The officials had to educate paper makers to the importance of the Association, and the wide field of usefulness it could be made to fill. For some years there was much apathy among members which had to be overcome slowly and diplomatically. The officials, however, had abundant faith in the prospects of the industry and the Association, and were not dismayed. General William Charles Plunkett died at his home in Adams, Mass., January 19, 1884. He was at one time a great figure in the paper business. He bought the Richardson & Upton paper mill at Adams about 1877 and organized the Adams Paper Company, his two sons being associated with him; but, after running it a few years, the mill was turned into a cotton mill.

Winthrop Murray Crane

When Winthrop Murray Crane, senator from and former Governor of Massachusetts, died October 2, 1920, President Calvin Coolidge said of him: "He inspired the love of all who knew him. In the affection of his fellow men, he stood first in Massachusetts. It is, no doubt, a commonplace to say our commonwealth will never be the same without him; but his loss will be felt in a way that will not be commonplace." He was born at Dalton, Mass., on April 23, 1853, the youngest son of Zenas M. Crane, who had inherited a great paper making plant from his father. Murray Crane went to the public schools of Dalton, then for a while attended Williston Seminary at Easthampton, but he never aspired to have a college education. Instead, when 17 years old, he informed his father that he was ready to start learning the business of paper making. The father, believing in thoroughness, started the son in at rag sorting, the lowliest and most unpleasant job in the mills. Murray Crane became a good rag sorter, and then he graduated to other parts of the mill. The result was that in a comparatively short time he knew paper from the rag to the finished product.

Bloomfield H. Moore

Bloomfield H. Moore was one of the founders of the Jessup & Moore Paper Company. He was born in Philadelphia, Pa., December 6, 1819, and died in 1870, leaving a distinguished name as a result of an active, patriotic and successful life. In 1843 Mr. Bloomfield entered into a partnership with his father-in-law, Augustine E. Jessup of Westfield, Mass., for the manufacture of paper and in 1845 began manufacturing at the Augustine Mill in Wilmington, Del. Subsequently they bought the mill at Rockland, continuing the manufacture of paper at these plants for many years. Being later destroyed by fire, both mills were rebuilt on the same sites and on those historic spots the enlarged and modernized mills of the Jessup & Moore Paper Company are carrying on the business. Historical interest is attached to Mr. Moore's company because of its association with the Brandywine River and its early paper mills. He was a widely read, polished gentleman who mastered every problem as it presented itself to him and was always fair in all his dealings.

Samuel Dennis Warren

Samuel Dennis Warren, of S. D. Warren & Co., paper manufacturers, died at Boston, May 11, 1888, aged seventy years. Mr. Warren was born in Grafton, Mass., September 13, 1817. His studies, begun in his

native town, were interrupted after several years at Amherst Academy by ill health. Immediately, although only fourteen years of age, he sought to enter upon active duties. A relative, Otis Daniell, offered him the position of boy in his paper warehouse. The style of the firm was at that time Grant & Daniell. At the age of twenty-one, they perceived that he had become indispensable to the interests of the business and offered him a partnership, which he accepted, and the style of the firm was changed to Grant, Daniell & Co. In the early part of 1853 Mr. Warren was enabled to put in practice his long cherished project of manufacturing on his own account. In that year the firm leased a small mill at Pepperell, Mass., capable of producing about 2 tons of paper a day. Besides the Pepperell mills, Mr. Warren later operated mills at Gardiner, Me., Yarmouth, Me., and Manchester, N. H.

Joseph C. Parsons

Joseph C. Parsons, president of the Parsons Paper Company, died at Holyoke, Mass., March 12, 1886. He spent forty-three years of his life in Holyoke and was one of the most successful paper makers of his time. He was born at Northampton, Mass., on February 6, 1814, and was educated at the academy at that place. At the age of fourteen he began to learn the drug business, and when he was twenty he went to Springfield, where he began business for himself, remaining till 1839. In 1840 he went back to Northampton and took charge of a paper mill owned by John Ames. He later went to South Hadley Falls, where he managed another mill owned by the Ameses. That mill was burned and Mr. Parsons went to Suffield, Conn., where he bought a hand mill, which had the credit of making the first American paper used by Congress. He organized the Eagle Mills Company with a capital stock of $30,000. In 1853 he sold his interest in the property and went to Holyoke, which was then in its infancy. With Col. Aaron Bragg and a number of others he organized the Parsons Paper Company, with a capital stock of $60,000, which was never increased, although the business done every year exceeded $1,000,000. By the death of Mr. Parsons Holyoke lost a citizen who was honored and respected by all who knew him.

Frank W. Fletcher

Frank W. Fletcher, founder of the Fletcher Paper Company and the Alpena Paper Company, both of Alpena, Mich., died Sunday, December 17, 1922. He was 69 years old and was an outstanding figure in Michigan affairs during two score years. With the passing of the lumber interests in northeastern Michigan, it was largely through his efforts that Alpena was saved the fate of Au Sable and given industries that made it the metropolis of that section of the state. In addition to his industrial activities, Mr. Fletcher served from 1896 to 1910 as regent of the University of Michigan. He was a graduate of that institution, also of Massachusetts Institute of Technology and Columbia School of Mines. In 1921 he presented the state of Michigan with a 160 acre pine land park on Thunder Bay.

Aaron Bagg, Jr.

Aaron Bagg, Jr., 83, died at his home at West Springfield, Mass., in November, 1922. For half a century or more he was in close touch with the paper industry of Holyoke. He was president of the Parsons Paper Company, of which his father, Col. Aaron Bagg, was one of the founders. It was in the early stages and success of this industry that Mr. Bagg accumulated a large part of his fortune. Mr. Bagg was probably one of the best known men in the town of West Springfield, where he spent his life and was one of the important financial men of the Connecticut Valley. He was a director of the Millers Falls Paper Company and of the Third National Bank of Springfield, a trustee of the Springfield Five Cents Savings Bank and of the Whiting Street Fund. Mr. Bagg was prominent in State and town affairs. He served one term in the Leg-

islature in 1890 and before that was one of the town's selectmen. He also served as auditor and his advice was frequently sought on financial matters. He was one of the committee chosen to build a new junior high school.

A. E. Harding

A. E. Harding was one of the prominent founders of the Association, and head of the Harding Paper Company, at Franklin, Ohio, died on Monday, April 6, 1886, at the age of fifty-six years. He was born in Shotter Mill, County of Surrey, England, March 14, 1827. His ancestors for several generations were paper makers. In 1856 Mr. Harding entered the firm of Harding, Erwin & Co., which built the Excello Mill. In 1872 the firm built the Franklin Mill, but in 1873 the firm was dissolved and the business and property passed to the Harding Paper Company, of which Mr. Harding was elected president, and under his guidance the firm became successful. In the fall of 1884 Mr. Harding suffered a stroke of paralysis from which he never fully recovered and which caused his death two years later.

P. H. Glatfelter

Philip Glatfelter, founder and owner of one of the oldest paper mills in America, was born in 1837 and died in July 1902. His ancestors migrated from Glatfelden, Switzerland. Being of a mechanical turn of mind, he entered in 1857 the mill of Loucks and Hoffman, located on the Gunpowder river in Maryland. After six years spent in mastering the art of papermaking, he became, at the age of 26, the owner of the paper mill at Spring Grove, Pa. Although he did not have the advantages of higher education, he was endowed with a clear mind and developed a keen and farsighted judgment which enabled him to make rapid advancement. The commercial success of Mr. Glatfelter was extraordinary considering his humble beginning, his distance from great centers of wealth and the absence of alliances with prosperous men. There was never attached to his dealings a breath of suspicion of unfairness or of the evasion of a contract or moral obligation. He manufactured honest goods which found a ready market and brought a merited reward. His modesty was proverbial. He never mentioned his achievements nor boasted of his successes. He lived a blameless life and was above all reproach.

Albrecht Pagenstecher

Albrecht Pagenstecher, a great figure in the early days of the industry in America, introduced ground wood pulp in this country. Mr. Pagenstecher was born in Osnabruck, Prussia, in 1839 and died, in his 88th year, at Cornwall, N. Y., August 8, 1926. Besides being the introducer of ground wood into the United States, Albrecht Pagenstecher was also the pioneer of the Canadian wood pulp industry. He organized the famous Laurentide Pulp Company, at Grand Mere, Que., and was its first president. Other concerns that he headed were the Hudson River Pulp and Paper Company, the Keith Paper Company, the Central Paper Company of Muskegon, Mich., and the Manufacturers' Paper Company. For many years he was a director of the International Paper Company, which had absorbed several of the plants in which he held large interests.

C. W. Rantoul

C. W. Rantoul was appointed secretary and treasurer of the Association to succeed Chester W. Lyman during the presidency of ex-Governor Cheney of New Hampshire, the twelfth president of the Association, in 1900-1901. The Association at that time was very largely a social organization, although the annual meeting brought a considerable fund of information to the attention of the members through the reports of the vice-presidents of the several divisions and there were at the business meetings always one or two special reports on various technical subjects by experts. Mr. Rantoul was also appointed chairman of the Committee on Statistics for the Association. Mr. Rantoul was born at Newbury-

port, Mass., and was educated in Boston. He graduated with the degree of A. B. at Harvard University in 1887 and studied law for a year in the Harvard Law School. He became associated with the paper industry in 1888 when he entered the employ of the Fairchild Paper Company, Boston, Mass. He is now head of the firm of C. W. Rantoul Company, paper mill agents, New York.

Horace Augustus Moses

Horace Augustus Moses, president of the Strathmore Paper Company, Mittineague, Mass., was born at Ticonderoga, N. Y., April 21, 1862. He graduated from the Troy Conference Academy, Poultney, Vermont, in 1881. He became interested in the paper industry in 1881 and has ever since exerted his talents in promoting its interests. He began his work with the Agawam Paper Company and organized the Mitteneague Paper Company. He consolidated that concern with the Woronco Paper Company in 1892 and in 1912 he merged it into the well-known Strathmore Paper Company, of which he is president and treasurer. Among his other official positions, Mr. Moses is a director of the Chicopee National Bank, of the West Springfield Trust Company, the Eisemann Magneto Corporation, the American Paper Exports, Inc., and the Taber-Prang Art Company.

George A. Whiting

George A. Whiting, president and treasurer of the George A. Whiting Paper Company, Menasha, Wis., and president of the Whiting-Plover Paper Company, Stevens Point, Wis., is one of the few survivors of the founders. Mr. Whiting conceived the idea of embarking in the industry in 1872. In 1872 he was a factor in the organization of the second mill making print paper on the Fox River. He bought a $2300 interest in the Winnebago Mill. He left his job and went into the mill and office at $60.00 a month. That was increased as time went on to $2,000 annually. He was with that concern for six years. In the spring of 1882, he built the Gilbert-Whiting mill at Menasha. Later he bought out his partner and ran it for many years as the Geo. A. Whiting Paper Mills. About twelve years ago he made a stock company of it, giving his son an interest. In 1888, in company with others, he built the South Centralia Pulp and Paper Company, and within three days from the time it started to make pulp, he sold out having secured options on two or three power sites on the Wisconsin River. In 1889 he began building the dam and pulp mill of the Wisconsin River Paper and Pulp Company. About twelve years ago he sold his interests in that and bought out his associates in the Plover Paper Company, now known as the Whiting-Plover Paper Company. In 1886 his mill at Menasha was burned. It was a great calamity and it looked to everybody as though Mr. Whiting's career had finished. He drew on everybody that owed him a dollar and paid up every cent that he owed, except the mortgage on the wreck, leaving him $1,000. The next day he commenced building, and re-starting in paper manufacturing.

William D. Judd.

William D. Judd, who had been in charge of sales, became president of the Carew Manufacturing Company, South Hadley Falls, Mass., with the passing of Charles H. Southworth in 1906. The Carew Manufacturing Company was established in 1848 by Joseph Carew and was acquired in the early '80's by John H. Southworth, one of the leaders in the paper business of his day, who introduced many advanced methods. In 1853 the commissioners of the World's Fair at New York awarded the first premium to the Carew Manufacturing Company to the surprise of English manufacturers and a commission of Englishmen visited the mill to see the process of

manufacture of machine made paper that had beaten their hand made paper. The company, in addition to Mr. Judd, has as its officials Cortlandt B. Griffin, a son of Solomon B. Griffin and a grandson of John H. Southworth as director and vice president, and George E. Bardwell, who has been sales manager for twenty years, as treasurer of the company. William D. Judd is also president of the Hampshire Paper Company which started in 1864. This concern was also directed by John H. Southworth and his son, Charles H. Southworth, successively from the organization of the company until 1906. It was under the leadership of Charles H. Southworth, that the Hampshire Paper Company decided to specialize on making one product "a little better than seems necessary" and a few years later they began to advertise Old Hampshire Bond in national magazines. The extensive advertising begun before other paper manufacturers recognized the advantage of well-considered publicity, has made Old Hampshire Bond a household word. Associated with Mr. Judd, present president of the company in the management, is Constant Southworth, treasurer, son of the late Charles H. Southworth and grandson of the founder.

Alexander G. Gilman

Alexander G. Gilman was born in Newburgh, N. Y., December 17, 1887, and was educated in the local public schools, the Newburgh Free Academy and the Cleary Business College, Ypsilanti, Mich. Among the important business offices he has held are the following: secretaryship of the Monarch Paper Company in 1909, presidency of the Monarch Paper Company, 1918; first vice-president of the Allied Paper Mills, 1921; president and general manager of the Allied Paper Mills, 1922—he still holds the presidency of the Allied Paper Mills, Kalamazoo, Mich. Besides the above offices, Mr. Gilman is now vice-president of the American Paper and Pulp Association and a member of the executive committee; a director of the Lincoln Paper Mills, Elkhart, Ind.; and president of the Michigan Paper Mills Traffic Association.

D. Clark Everest

D. Clark Everest was born at Pine Grove, Mich., October 13, 1883. After passing through the local high school he obtained employment with the Bryant Paper Company, Kalamazoo, Mich. in 1900. He became assistant manager of the Munising Paper Company, Munising, Mich. in November, 1902 and in November 1907 a partner in the Williams Gray Company, Chicago, Ill. On March 1, 1909 Mr. Everest was elected secretary and general manager of the Marathon Paper Mills Company, Rothschild, Wis. He is also president of the Ontonagon Fibre Company, Ontonagon, Mich.; secretary and treasurer of the Tomahawk Kraft Paper Company, Tomahawk, Wis.; vice-president of the Longview Fibre Company, Longview, Wash., and a partner in the Ewing Everest Pulp Company, Merrill, Wis.

Winthrop Lakey Carter

Winthrop Lakey Carter was born in West Newton, Mass., February 19, 1885, a son of the late James Richard and Carrie Giles Carter. He attended the public schools of Newton, Mass., was graduated from Newton High School with the class of 1902, and then entered Yale College from which he was graduated in 1907. Immediately after graduation from college he became associated with the Nashua Gummed and Coated Paper Company of which he was made treasurer in 1912. He continued to fill that office until the fall of 1923 when, through the death of his father, he became president of the concern. He is also identified with other paper manufacturing interests including the Canadian Nashua Paper Company, which he serves as president; the Gummed Paper Manufacturing Company, Ltd., of Leicester, England, which he serves as director, and the Nashua Pack-

age Sealing Company, of which he is also president. He is a director of Carter Rice & Co., of Boston; vice-president of the Berwin Paper Corporation, of Dansville, N. Y., and president of the Canadian Sealright Company of Canada. He was president of the American Waxed Paper Association from 1924-1925, since which time he has served actively on the executive committee. Mr. Carter is also a member of the executive committee of the American Paper and Pulp Association. The Nashua Gummed and Coated Paper Company is a large and important concern and Mr. Carter is closely in touch with all its operations.

Milton E. Marcuse

Milton E. Marcuse was born in Richmond, Va., Aug. 27, 1869. He entered the paper business in 1904 with the Bedford Pulp and Paper Company, which he helped organize; he became president in 1918. Mr. Marcuse is also vice-president of the General Paper Company, Buck Run, Pa.; director of the West Disinfecting Company, New York, president of Bank of Big Island, director in the Merchants National Bank of Richmond, director of U. S. Chamber of Commerce, a member of the Executive Committee of the American Paper and Pulp Association, and a member of various local and civic clubs in Richmond.

Hugh Potter Baker

Dr. Hugh Potter Baker, the present secretary of the Association was born at St. Croix Falls, Wis., January 20, 1878, and after attending and teaching country school secured the degree of B. Sc., in the Michigan State College in 1901. In 1904, he received the degree of Master of Forestry from Yale University and in 1910 the degree of Doctor of Economics in the University of Munich, Bavaria. Dr. Baker was employed by the United States Forest Service for a period of ten years, and later was professor of forestry in the Iowa State College in 1904-1907, and in the Pennsylvania State College in 1907-1912. He was dean and professor of Silviculture in the New York State College of Forestry, Syracuse in 1912-1920. The American Paper and Pulp Association secured his services as executive secretary in 1920. Dr. Baker is a man of great personal charm, a student and a sterling friend to all who are fortunate in possessing his acquaintance. His extraordinary executive abilities are testified to by the splendid efficiency of the Association which he guides and serves so wisely. Dr. Baker is a major in the Officers Reserve Corps and served in the Regular Infantry and on the General Staff of the Army in 1917-1918. He is a member of Fellow Royal Geographical Society of London, the American Geographical Society, New York Academy of Sciences, and Society of American Foresters. Dr. Baker is also a member of the Yale Club of New York, University Club of Syracuse, Cosmos Club of Washington, D. C. and the Union League of Chicago.

Oliver M. Porter

Oliver M. Porter, who for the past seven years has ably assisted Dr. Hugh P. Baker in the administration of the office of executive secretary of the association, was born February 23, 1892 at Kensington, Conn. Mr. Porter graduated at Haverford College and Yale University with the degrees of S.B., M.A. and M.F. Prior to the war, Mr. Porter was in the Government Forestry Service, Oregon. With the entry of the United States into the World War, he enlisted in the 10th Engineers, U.S.A. and served twenty months in France in charge of fuel operations in the S.O.S. He is a major in the engineering Reserve Corps. Mr. Porter taught forest engineering at the New York State College of Forestry, Syracuse University in 1919-1920. He was appointed assistant secretary of the American Paper and Pulp Association in 1920 and has filled that important position ever since with credit to himself and with entire satisfaction to the officers and members of the Association generally.

FORMER OFFICERS OF AMERICAN PAPER AND PULP ASSOCIATION

1878-1879

President, Hon. William Whiting, Holyoke, Mass.; Vice President, Gen. John T. Averill, St. Paul, Minn.; Vice President, John H. Hall, New York; Secretary, Charles O. Chapin, Springfield, Mass.; Treasurer, James Hill, Middletown, Ohio.

1879-1880

President, Hon. William Whiting, Holyoke, Mass.; 1st Vice President, Wellington Smith, Lee, Mass.; 2nd Vice President, John T. Averill, St. Paul, Minn.; Secretary, Charles O. Chapin, Springfield, Mass.; Treasurer, James A. Hill, Middletown, Ohio.

1880-1881

President, Wellington Smith, Lee, Mass.; 1st Vice President, O. H. Greenleaf, Holyoke, Mass.; 2nd Vice President, William Manning, Miamisburg, Ohio; Secretary, Charles O. Chapin, Springfield, Mass.; Treasurer; George W. Wheelwright, Boston, Mass.

1881-1882

President, Wellington Smith, Lee, Mass.; 1st Vice President, O. H. Greenleaf, Holyoke, Mass.; 2nd Vice President, William Manning, Miamisburg, Ohio; Secretary, Charles O. Chapin, Springfield, Mass.; Treasurer, George W. Wheelwright, Boston, Mass.

1882-1883

President, Wellington Smith, Lee, Mass.; 1st Vice President, O. H. Greenleaf, Holyoke, Mass.; 2nd Vice President, A. E. Harding, Franklin, Ohio; Secretary, Charles O. Chapin, Springfield, Mass.; Treasurer, George W. Wheelwright, Boston, Mass.

1883-1884

President, J. W. French, Three Rivers, Mich.; Vice Presidents: Writing, O. H. Greenleaf, Springfield, Mass.; Book, J. G. Ditman, Philadelphia.; Newspaper, J. L. Rubel, Louisville, Ky.; Manila, George West Ballston, New York; Straw paper, George N. Friend, Lockland, Ohio; Boards, Maurice Fitzgibbons, Boonton, N. J.; Secretary and Treasurer, D. P. Crocker, Springfield, Mass.

1884-1885

President, Wm. H. Parsons, New York; Vice Presidents: Writing, O. H. Greenleaf, Holyoke, Mass.; W. R. Sheffield, Saugerties, N. Y.; Book, George R. Dickinson, Holyoke, Mass; J. L. Rubel, Louisville, Ky.; News, Geo. W. Kussell,, Lawrence, Mass; J. A. Kimberly, Appleton, Wis.; Manila, J. T. Averill, St. Paul, Minn.; Moses Newton, Holyoke, Mass.; Straw Wrapping, H. S. Van de Carr, Stockport, N. Y.; C. M. Smith, Chicago; Straw Boards, B. C. Faurot, Lima, Ohio; C. D. Brown, Portland, Me.; Secretary and Treasurer, D. P. Crocker, Springfield.

1885-1886

President, Wm. H. Parsons, New York; Vice Presidents, Writing, O. H. Greenleaf, Holyoke, Mass.; W. K. Sheffield, Saugerties, N. Y.; Book, Augustine Smith, New York; George H. Friend, Lockland, Ohio; News, Charles T. Crocker, Boston, Mass; J. Van Nortwick, Chicago, Ill; Manila, J. T. Averill, St. Paul, Minn.; Charles A. Dean, Boston, Mass.; Straw Wrapping, H. S. Van de Carr, Stockport, N. Y.; C. M. Smith, Chicago; Boards, C. D. Brown, Portland, Me.; J. F. Sieberling, Akron, Ohio; Secretary and Treasurer, D. P. Crocker, Springfield.

1886-1887

President, Hon. Byron Weston, Dalton, Mass.; Secretary and Treasurer, E. C. Rogers, Holyoke, Mass; Vice Presidents: Writing, John S. McElwain, Holyoke, Mass.; C. H. Harding, Franklin, Ohio; Book, Edward C. Taft, Holyoke, Mass.; M. B. Mason, Boston, Mass.; News, George W. Russell, Boston, Mass.; Hiram Allen, Sandy Hill, N. Y.; Manila, Hon. George West, Ballston Spa, N. Y.; Moses Newton, Holyoke, Mass.; Straw Wrapping, H. S. Van de Carr, Stockport, N. Y.; C. M. Smith, Chicago; Boards, C. D. Brown, Portland, Me.; J. F. Seiberling, Akron, Ohio.

1887-1888

President, Hon. Byron Weston, Dalton, Mass.; Secretary and Treasurer, E. C. Rogers, Holyoke, Mass.; Vice Presidents: Writing, John S. McElwain, Holyoke, Mass.; C. H. Harding, Franklin, Ohio; Book, Edward C. Taft, Holyoke, Mass.; M. B. Mason, Boston, Mass.; News, George W. Russell, Boston, Mass.; Hiram Allen, Sandy Hill, N. Y.; Manila, Hon. George West, Ballston Spa, N. Y.; Moses Newton, Holyoke, Mass.; Straw Wrapping, H. S. Van de Carr, Stockport, N. Y.; C. M. Smith, Chicago; Boards, C. D. Brown, Portland, Me.; J. F. Seiberling, Akron, Ohio.

1888-1889

President, E. C. Rogers, Holyoke, Mass.; Vice Presidents: Writing, T. A. Mole, Adams, Mass; C. H. Mullen, Mount Holly Springs, Pa.; Book, M. B. Mason, Boston, Mass.; N. T. Pulsifer, Manchester, Conn.; News, C. G. Weeks, Skaneateles, N. Y.; Loren Allen, Sandy Hill, N. Y.; Manila, J. M. Waterbury, New York; J. M. Johnson, Middletown, Ohio. Straw Wrapping, H. S. Van de Carr, Stockport, N. Y.; C. M. Smith, Chicago; Boards, C. D. Brown, Portland, Me.; C. L. Hawes, Dayton, Ohio; Chemical Fiber, E. H. Clapp, Boston, Mass.; R. H. Emerson, Jackson, Mich; Secretary, Oscar S. Greenleaf, Holyoke, Mass.

1889-1890

President, E. C. Rogers, Holyoke, Mass; Vice Presidents: Writing, T. A. Mole, Adams, Mass; C. H. Mullen, Mount Holly Springs, Pa.; Book, M. B. Mason, Boston, Mass.; F. C. Shattuck, Neenah, Wis.; News, C. G. Weeks Skaneateles, N. Y.; Warren Curtis, Palmers' Falls, N. Y.; Manila, J. M. Waterbury, New York; J. M. Johnson, Middletown, Ohio; Straw Wrapping, H. S. Van de Carr, Stockport, N. Y.; C. M. Smith, Chicago, Ill.; Boards, C. D. Brown, Portland, Me.; O. C. Barber, Akron, Ohio; Chemical Fiber, E. H. Clapp, Boston, Mass.; R. H. Emerson, Jackson, Mich.; Secretary, Oscar S. Greenleaf, Holyoke, Mass.

1890-1891

President, W. A. Russell, Lawrence, Mass.; Vice Presidents: Writing, B. D. Rising, Springfield, Mass.; C. H. Mullin, Mount Holly Springs, Pa.; Book, Charles D. Brown, Boston, Mass, F. C. Shattuck, Neenah, Wis.; News, T. F. Rice, Chicago, Ill.; Warren Curtis, Palmer's Falls, N. Y.; Manila, D. W. Mabee, Ballston Spa, N. Y.; Robert McAlpine, Marinette, Wis.; Straw Wrapping, H. S. Van de Carr, Stockport, N. Y.; H. E. Mead, Dayton, Ohio; Boards, E. B. Denison, Portland, Me.; O. C. Barber, Akron, Ohio; Chemical Fiber, J. A. Kimberly, Appleton, Wis.; Moses Newton, Holyoke, Mass.; Secretary, William T. Barker, Boston, Mass.; Treasurer, Oscar S. Greenleaf, Springfield, Mass.

1891-1892

President, William A. Russell, Lawrence, Mass; Vice-Presidents: Writing, William Whiting, Holyoke, Mass.; Book, George W. Russell, Lawrence, Mass.; News, F. H. Parks, Glens Falls, N. Y.; Manila, Robert McAlpine, Marinette, Wis.; Straw Wrapping, H. E. Mead, Dayton, Ohio; Boards, O. C. Barber, Akron, Ohio; Wood Pulp Hugh J. Chisholm, Portland, Me.; Chemical Fiber, A. G. Paine, New York; Secretary and Treasurer, William T. Barker, Boston, Mass.

1892-1894

President, Warner Miller, New York; Vice-Presidents: Writing, William Whiting, Holyoke, Mass.; Book, George W. Russell, Lawrence, Mass.; News, H. A. Frambach, Kaukana, Wis.; Manila, J. S. Van Nortwick, Appleton, Wis. Straw Wrapping, Thomas F. Rice, Chicago, Ill.; Boards, O. C. Barber, Akron, Ohio; Wood Pulp, Hugh J. Chisholm, Portland, Me.; Chemical Fiber, A. G. Paine, New York; Secretary and Treasurer, William T. Barker, Boston, Mass.

1894-1896

President, Augustus G. Paine, New York; Vice Presidents, Writing, Arthur W. Eaton, South Lee, Mass.; Book, William T. Barker, Boston, Mass.; News, H. A. Frambach, Kaukauna, Wis.; Manila, W. C. Hamilton, Marinette, Wis.; Straw Wrapping, J. B. Halliday, Chicago Ill.; Wood Pulp, Hugh J. Chisholm, Portland, Me.; Chemical Fiber, Thomas Duncan, Hartford, Conn.; Boards, O. C. Barber, Akron, Ohio; Secretary and Treasurer, George C. Sherman, Watertown, N. Y.

1896-1897

President, George F. Perkins, New York; Vice Presidents: Writing, W. S. Whiting, Holyoke, Mass.; Book, J. N. Mohr, Philadelphia, Pa.; News, G. C. Sherman, Watertown, N. Y.; Manila, D. W. Mabee, Ballston Spa, N. Y.; Straw Wrapping, M. J. Fitch, Chicago, Ill.; Wood Pulp, K. B. Fullerton, New York; Chemical Fiber, A. G. Paine, Jr., New York; Boards, J. W. French, Niles, Mich.; Secretary and Treasurer, W. H. Parsons, Jr., New York.

1897-1898

President, Hugh J. Chisholm, Portland, Me.; Vice Presidents, Writing, W. F. Whiting, Holyoke, Mass.; Book, J. N. Mohr, Philadelphia, Pa.; News, G. C. Sherman, Watertown, N. Y.; Manila and Wrapping, Col. S. P. Train, Boston; Wood Pulp, K. B. Fullerton, New York; Chemical Fiber, A. G. Paine, Jr., New York; Boards, Col. J. W. French, Niles, Mich.; Secretary and Treasurer, C. W. Lyman, Herkimer, N. Y.

1898-1899

President, Hugh J. Chisholm, Portland, Me.; Vice Presidents, W. F. Whiting, Holyoke, Mass.; Book, J. N. Mohr, Philadelphia, Pa.; News, G. C. Sherman, Watertown, N. Y.; Wrapping, Col. Samuel P. Train, Boston; Wood Pulp, K. B. Fullerton, New York; Chemical Fiber, A. G. Paine, Jr., New York; Board, Charles D. Brown; Secretary and Treasurer, Chester W. Lyman, Herkimer, N. Y.

1899-1900

President, P. C. Cheney, Manchester, N. H.; Vice Presidents: Writing, W. Murray Crane; Wrapping C. A. Dean, Boston, Mass.; Book, M. M. Armstrong, New York; Chemical Fiber, George P. Hammond, Yarmouthville, Me.; Boards, E. B. Dennison, Portland, Me.; Dealers, Frank Squier, New York; Secretary and Treasurer, C. W. Kantoul, New York.

1900-1901

President, P. C. Cheney, Manchester, N. H.; Vice Presidents: Writing, Elisha Morgan, Springfield, Mass; Book, M. M. Armstrong, New York; News, F. H. Parks, New York; Manila and Wrapping, C. A. Dean, Boston, Mass.; Chemical Fiber, George W. Hammond, Yarmouthville, Me.; Boards, E. B. Dennison, Portland, Me.; Dealers, Frank Squier, New York; Secretary and Treasurer, C. W. Rantoul, New York. Yor.

1901-1902

President, A. C. Hastings, Niagara Falls, N. Y.; Vice Presidents: Writing, W. N. Caldwell, Springfield, Mass; Book, C. W. Rantoul, New York; News, G. W. Knowlton, Watertown, N. Y.; Manila and Wrapping, John S. Riegel, New York; Chemical Fiber, John G. Luke, New York; Boards, C. S. Merrill, Albany, N. Y.; Dealers, J. B. Forsyth, Boston, Mass.; Secretary and Treasurer, J. Sanford Barnes, New York.

1902-1903

President, A. C. Hastings, Niagara Falls, N. Y.; Vice Presidents: Writing, W. N. Caldwell, Springfield, Mass.; Book, C. W. Rantoul, New York; News, G. W. Knowlton, Watertown, N. Y.; Manila and Wrapping, John S. Riegel, New York; Chemical Fiber, John G. Luke, New York; Boards, C. S. Merrill, Albany, N. Y.; Dealers, J. B. Forsyth, Boston, Mass.; Secretary and Treasurer, J. Sanford Barnes, New York.

1903-1904

President, George W. Knowlton, Watertown, N. Y.; Vice Presidents: Writing, B. D. Rising, Housatonic, Mass.; Book, George E. Bardeen, Otsego, Mich.; News, J. Sanford Barnes, New York; Manila and Wrapping, Frank Grubb, New York; Chemical Fiber, Frederick Bertuch, New York; Boards, James A. Roberts, Albany, N. Y.; Dealers, J. Richard Carter, Boston, Mass.; Secretary and Treasurer, Arthur E. Wright, New York.

1904-1905

President, George W. Knowlton, Watertown, N. Y.; Vice Presidents: Writing, R. L. McElwain, Springfield, Mass.; Book, George E. Bardeen, Otsego, Mich.; News, J. Sanford Barnes, Jr., New York; Manila and Wrapping, Frank Grubb, New York; Chemical Fiber and Wood Pulp, Frederick Bertuch, New York; Boards, James A. Roberts, New York; Dealers, J. Richard Carter, Boston, Mass.; Tissue, W. O. Ball, Watertown, N. Y.; Secretary and Treasurer, A. E. Wright, New York.

1905-1906

President, W. N. Caldwell, Holyoke, Mass.; Vice Presidents: Writing, Charles McKernon, Housatonic, Mass.; Book, Geo. T. Keyes, East Pepperell, Mass.; News, David S. Cowles, New York; Manila and Wrapping, James Rogers, Ausable Forks, N. Y.; Chemical Fiber, Theo. P. Burgess, Boston; Boards, R. B. McEwan, New York; Dealers, C. F. M. Smith, Chicago; Tissue, W. O. Ball, Carthage, N. Y.; Secretary and Treasurer, Adam Luke, New York.

1906-1907

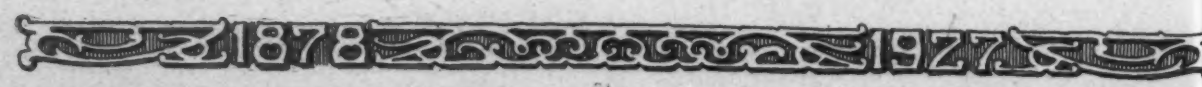
President, W. N. Caldwell, Holyoke, Mass.; Vice Presidents: Writing, A. B. Daniels, Adams, Mass.; Book, James N. Mohr, Reading, Pa.; News, H. J. Brown, Portland, Me.; Manila and Wrapping, Charles A. Dean, Boston, Mass.; Chemical Fiber, C. E. Bush, Ticonderoga, N. Y.; Boards, A. H. Ivins, Bogota, N. J.; Tissue, E. C. Robertson, Hinsdale, N. H.; Secretary and Treasurer, Adam Luke, New York.

1907-1908

President, David S. Cowles, New York; Vice Presidents: Writing, A. B. Daniels, Adams, Mass.; Book, A. G. Paine, Jr., New York; News, C. H. Remington, Watertown, N. Y.; Manila and Wrapping, E. P. Lindsay, Boston, Mass.; Pulp, George M. McKee, Hinckley, N. Y.; Boards, A. H. Ivins, Bogota, N. J.; Tissue, E. C. Robertson, Hinsdale, N. H.; Secretary and Treasurer, Louis Chable, New York.

1908-1909

President, David S. Cowles, New York; Vice Presidents: Writing, C. M. Burnett, Turners Falls, Mass.; Book, A. G. Paine, Jr., New York; News, C. H. Remington, Watertown,



N. Y.; Manila and Wrapping, E. P. Lindsay, Boston, Mass.; Pulp, George M. McKee, Hinckley, N. Y.; Boards, H. L. Paddock, Fulton, N. Y.; Tissue, E. C. Robertson, Hinsdale, N. H.; Secretary and Treasurer, Louis Chable, New York.

1909-1910

President, Arthur C. Hastings, Niagara Falls, N. Y.; Vice President, George F. Steele, Nekoosa, Wis.; Secretary and Treasurer, Louis Chable, New York; Members of Executive Council: News, Frank J. Sensenbrenner, Neenah, Wis.; Wrapping, George W. Sisson, Jr., Potsdam, N. Y.; Chemical Pulp, George M. McKee, Hinckley, N. Y.; Book, David L. Luke, New York; Writing, A. W. Esleeck, Turners Falls, Mass.; Tissue, W. O. Ball, Carthage, N. Y.; Pulp Board, H. Lester Paddock, Fulton, N. Y.; Ground Wood Pulp, David M. Anderson, Watertown, N. Y.; Bag Paper, Frank L. Moore, Newton Falls, N. Y.; Pulp Wood, Maurice Hoopes, Glens Falls, N. Y.

1910-1911

President, Arthur C. Hastings, Niagara Falls, N. Y.; Vice President, George F. Steele, Nekoosa, Wis.; Secretary and Treasurer, C. I. McNair, Cloquet, Minn.; Members of Executive Council: News, Frank J. Sensenbrenner, Neenah, Wis.; Wrapping, George W. Sisson, Jr., Potsdam, N. Y.; Chemical Pulp, George M. McKee, Hinckley, N. Y.; Book, David L. Luke, New York City; Writing, A. W. Esleeck, Turners Falls, Mass.; Tissue, W. O. Ball, Carthage, N. Y.; Pulp Board, H. Lester Paddock, Fulton, N. Y.; Ground Wood Pulp, David M. Anderson, Watertown, N. Y.; Bag Paper, Frank L. Moore, Newton Falls, N. Y.; Pulp Wood, Maurice Hoopes, Glens Falls, N. Y.; Specialties Division, H. W. Ellerson, Richmond, Va.

1911-1912

President, Arthur C. Hastings, Niagara Falls, N. Y.; Vice President, George F. Steele, Port Edwards, Wis.; Secretary and Treasurer, C. I. McNair, Cloquet, Minn.; Asst. Secretary-Treasurer, Arthur G. Maury; Members of Executive Council: News, Frank J. Sensenbrenner, Neenah, Wis.; Wrapping, Henry W. Stokes, Philadelphia, Pa.; Chemical Fiber, Thos. Hunter, Fulton, N. Y.; Book, Arthur L. Pratt, Kalamazoo, Mich.; Writing, W. D. Judd, South Hadley Falls, Mass.; Tissue, E. R. Redhead, Fulton, N. Y.; Board, R. C. Richardson, Lockland, Ohio; Ground Wood Pulp, J. G. Rosebush, Combined Locks, Wis.; Wood Division, Edgar G. Barrett, New York; Specialties Division, S. A. Upham, Brownville, N. Y.

1912-1913

President, Arthur C. Hastings, Niagara Falls, N. Y.; Vice President, George F. Steele, Port Edwards, Wis.; Asst. Secretary-Treasurer, Arthur G. Maury; Members of Executive Council: News, H. J. Brown, Portland, Me.; Wrapping, Henry W. Stokes, Philadelphia, Pa.; Chemical Pulp, Thos. Hunter, Fulton, N. Y.; Book, Arthur L. Pratt, Kalamazoo, Mich.; Writing, W. D. Judd, South Hadley Falls, Mass.; Tissue, E. R. Redhead, Fulton, N. Y.; Boards, Charles R. White, Chicago; Ground Wood Pulp, Judson G. Rosebush, Appleton, Wis.; Specialties Div., S. A. Upham, Brownville, N. Y.; Coated Board, B. C. Hill, Niagara Falls, N. Y.; Coated Paper, Martin Cantine, Saugerties, N. Y.

1913-1914

President, Arthur C. Hastings, New York; Vice President, Clarence I. McNair, Cloquet, Minn.; Secretary, Chas. F. Moore, New York; Asst. Secretary-Treasurer, Arthur C. Maury, New York; Members of Executive Council: News, C. A. Babcock, Stevens Point, Wis.; Wrapping, Frank L. Moore, Watertown, N. Y.; Chemical Pulp, Thomas Hunter, Fulton, N. Y.; Book, A. G. Paine, Jr., New York; Writing, C. A. Crocker, Holyoke, Mass.; Tissue, E. C. Robertson, Hinsdale, N. H.; Board Div., F. S. Harrison, Halltown, W. Va.; Ground Wood, E. A. Merritt, Jr., Potsdam, N. Y.; Coated Board, B. C. Hill, Niagara Falls, N. Y.; Coated Paper, Martin Cantine, Saugerties, N. Y.

1914-1915

President, Frank L. Moore, Watertown, N. Y.; Treasurer, Arthur G. Maury, New York; Statistician, A. J. Stewartson, New York; Executive Committee: Wrapping, H. H. Bishop, New York; L. M. Alexander, Port Edwards, Wis.; Geo. C. Bayless, Austin, Pa.; Geo. E. Crafts, Bangor, Me.; Allan M. Fletcher, Alpena, Mich.; M. E. Marcuse, Richmond, Va.; Tissue, Frank N. Stevens, North Hoosick, N. Y.; W. R. Hobbie, Greenwich, N. Y.; Board, C. E. Williams, Pierpont, N. Y.; F. S. Harrison, Halltown, W. Va.; Pulp, E. W. Kieffer, Port Huron, Mich.; Frederick McNicholl, New York; T. J. Stevenson, Montreal, Canada; News, P. T. Dodge, New York; J. A. B. Cowles, New York; Maurice A. Hoopes, Glens Falls, N. Y.; Writing, C. A. Crocker, Holyoke, Mass.; F. J. Sensenbrenner, Neenah, Wis.; E. H. Behrend, Erie, Pa.; E. H. Naylor, New York; Book, Charles F. Moore, New York.

1915-1916

President, Frank L. Moore, Watertown, N. Y.; Vice President, F. J. Sensenbrenner, Neenah, Wis.; Secretary-Treasurer, A. D. Naylor, New York; Statistician, A. J. Stewartson, New York; Executive Committee: Wrapping, H. H. Bishop, New York; L. M. Alexander, Port Edwards, Wis.; Geo. C. Bayless, Austin, Pa.; Geo. E. Crafts, Bangor, Me.; Allan M. Fletcher, Alpena, Mich.; M. E. Marcuse, Richmond, Va.; Tissue, Frank L. Stevens, North Hoosick, N. Y.; E. H. Naylor, New York; Pulp, E. W. Kieffer, Port Huron, Mich.; Frederick McNicholl, New York; T. J. Stevenson, Montreal, Canada; News, P. T. Dodge, New York; J. A. B. Cowles, New York; Maurice A. Hoopes, Glens Falls, N. Y.; Writing, Arthur B. Daniels, Adams, Mass.; W. Z. Stuart, Neenah, Wis.; Arthur C. Hastings, Holyoke, Mass.; E. H. Naylor, New York; Book, Charles F. Moore, New York.

1916-1917

President, Arthur B. Daniels, Adams, Mass.; Vice President, Frank L. Moore, Watertown, N. Y.; Vice President, F. J. Sensenbrenner, Neenah, Wis.; Secretary and Treasurer, A. D. Naylor, New York.

1917-1918

President, Arthur B. Daniels, Adams, Mass.; Vice President, Frank L. Moore, Watertown, N. Y.; Vice President, L. M. Alexander, Port Edwards, Wis.; Secretary and Treasurer, A. D. Naylor, New York.

1918-1919

President, George W. Sisson, Jr., Potsdam, N. Y.; Vice President, Frank L. Stevens, North Hoosick, N. Y.; Vice President, L. M. Alexander, Port Edwards, Wis.; Secretary and Treasurer, L. B. Steward, New York.

1919-1920

President, George W. Sisson, Jr., Potsdam, N. Y.; Vice President, Frank L. Stevens, North Hoosick, N. Y.; Vice President, Arthur H. Nevius, West Carrollton, Ohio; Secretary and Treasurer, L. B. Steward, New York.

1920-1921

President, George W. Sisson, Jr., Potsdam, N. Y.; Vice President, Frank L. Stevens, North Hoosick, N. Y.; Vice President, Arthur H. Nevius, West Carrollton, Ohio; Secretary and Treasurer, Hugh P. Baker, New York; Counsellor, Henry A. Wise, New York.

1921-1922

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1922-1923

President, W. J. Raybold, Housatonic, Mass.; Vice President, H. W. Stokes, Philadelphia, Pa.; Vice President, A. L. Pratt, Kalamazoo, Mich.; Secretary and Treasurer, Hugh P. Baker, New York.

1923-1924

President, Henry W. Stokes, Philadelphia, Pa.; Vice President (Eastern), Norman W. Wilson, Erie, Pa.; Vice President (Western), Walter R. Randall, Hamilton, Ohio; Secretary, Hugh P. Baker, New York.

1924-1925

President, Henry W. Stokes, Philadelphia, Pa.; Vice President (Eastern), Norman W. Wilson, Erie, Pa.; Vice President (Western), Alex. G. Gilman, Kalamazoo, Mich.; Secretary and Treasurer, Hugh P. Baker, New York.

1925-1926

President, Norman W. Wilson, Erie, Pa.; Vice President, Alex. G. Gilman, Kalamazoo, Mich.; Vice President, D. C. Everest, Rothschild, Wis.; Secretary and Treasurer, Hugh P. Baker, New York.

1926-1927

President, Norman W. Wilson, Erie, Pa.; Vice President, Alex. G. Gilman, Kalamazoo, Mich.; Vice President, D. C. Everest, Rothschild, Wis.; Secretary and Treasurer, Hugh P. Baker, New York.

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American Pulp and Paper Mill Superintendents' Association

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American Waxed Paper Association

President, Arthur Havemeyer, Package Paper Co.; Secretary, M. C. Warwick, 18 E. 41st St., New York.

Binders Board Manufacturers Association

President, Leigh H. Davey, The Davey Co.; Secretary, O. M. Porter, 18 E. 41st St., New York.

Cardboard Manufacturers Association

President, Raymond Bee, United Paperboard Co.; Secretary, Kendall Wyman, 233 Broadway, New York.

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President, Minor M. Beckett, Beckett Paper Co.; Secretary, E. H. Naylor, 44 Vernon St., Springfield, Mass.

Glazed and Fancy Paper Manufacturers Association

President, K. N. Fowler, Hampden Glazed Paper & Card Co.; Secretary, O. M. Porter, 18 E. 41st St., New York.

National Association of Gummed Tape Manufacturers

President, George Goodsir, McLaurin-Jones Co.; Secretary, M. C. Warwick, 18 E. 41st St., New York.

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President, Walter E. Perry, Chemical Paper Mfg. Co.; Secretary, D. A. Crocker, 18 E. 41st St., New York.

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President, Geo. K. Spence, New York & Pennsylvania Co.; Secretary, W. G. MacNaughton, 18 E. 41st St., New York.

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President, Z. W. Ranck, Crystal Tissue Co.; Secretary, E. H. Naylor, 44 Vernon St., Springfield, Mass.

U. S. Pulp Producers Association

President, Herman Elsas, Continental Paper & Bag Mills Corp.; Secretary, O. M. Porter, 18 E. 41st St., New York.

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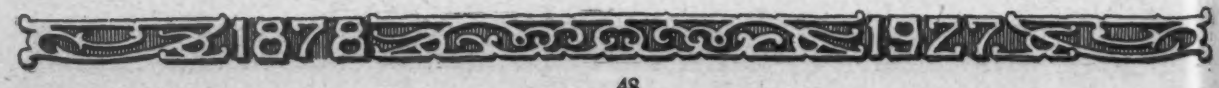
Writing Paper Manufacturers Association

President, Winthrop M. Crane, Jr., Crane & Co.; Secretary, E. H. Naylor, 44 Vernon St., Springfield, Mass.



MEMBERS AMERICAN PAPER AND PULP ASSOCIATION

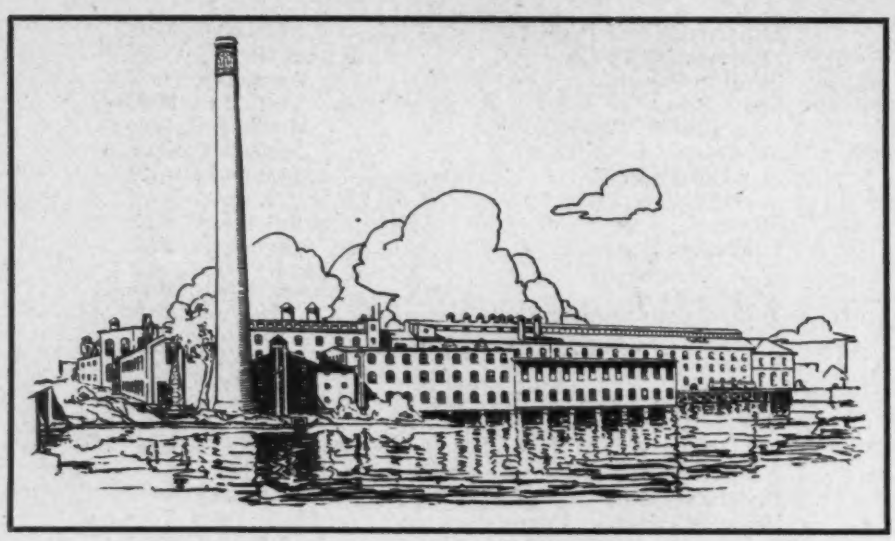
Advance Bag & Paper Co.	Boston, Mass.
Advertisers Paper Mills	Holyoke, Mass.
Aetna Paper Co.	Dayton, Ohio.
Albemarle Paper Mfg. Co.	Richmond, Va.
Allied Paper Mills	Kalamazoo, Mich.
Algonquin Paper Corp.	Ogdensburg, N. Y.
American Bread Wrapper Co.	Chicago, Ill.
American Coating Mills	Elkhart, Ind.
American Wood Board Co.	Schuylerville, N. Y.
American Writing Paper Co.	Holyoke, Mass.
Appleton Coated Paper Co.	Appleton, Wis.
A. P. W. Paper Co.	Albany, N. Y.
Arrowhead Mills, Inc.	Fulton, N. Y.
Bayless Mfg. Corp.	Austin, Pa.
Beaver Products Co., Inc.	Buffalo, N. Y.
Beckett Paper Co.	Hamilton, Ohio.
Bedford Pulp & Paper Co.	Richmond, Va.
Bergstrom Paper Co.	Neenah, Wis.
Berkshire Hills Paper Co.	Adams, Mass.
Better Packages, Inc.	New York, N. Y.
Bird & Son	East Walpole, Mass.
Boyd, C. S., Paper Co.	Appleton, Wis.
Brown, L. L., Paper Co.	Adams, Mass.
Brown Paper Mill Co.	Monroe, La.
Brownville Board Co.	Brownville, N. Y.
Brownville Paper Co.	Brownville, N. Y.
Bryant Paper Co.	Kalamazoo, Mich.
Burrows Paper Corp.	Little Falls, N. Y.
Cantine, Martin, Co.	Saugerties, N. Y.
Carew Mfg. Co.	South Hadley Falls, Mass.
Carolina Fiber Co.	Hartsville, S. C.
Cascade Paper Co.	West Tacoma, Wash.
Central Paper Co.	Muskegon, Mich.
Central Paper Co.	Menasha, Wis.
Central Waxed Paper Co.	Chicago, Ill.
Champion Coated Paper Co.	Hamilton, Ohio.
Champion Fibre Co.	Canton, N. C.
Champion-International Co.	Lawrence, Mass.
Chapin & Gould Paper Co.	Springfield, Mass.
Chemical Paper Mfg. Co.	Holyoke, Mass.
Cherry River Paper Co.	Philadelphia, Pa.
Chesapeake Corp.	West Point, Va.
Chillicothe Paper Co.	Chillicothe, Ohio.
Claremont Paper Co.	Claremont, N. H.
Cliff Paper Co.	Niagara Falls, N. Y.

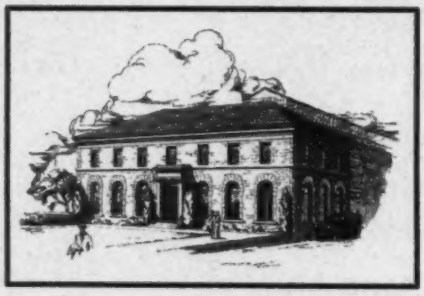
Clifton Paper Mills	Passaic, N. J.
Coated Paper Products Co.	Minerva, Ohio.
Collins Mfg. Co.	Holyoke, Mass.
Collins, A. M. Mfg. Co.	Philadelphia, Pa.
Columbia River Paper Mills	Vancouver, Wash.
Consolidated Paper Co.	Monroe, Mich.
Consolidated Water Power & Paper Co.	Wisconsin Rapids, Wis.
Continental Paper & Bag Mills Corp.	New York, N. Y.
Cornell Wood Products Co.	Chicago, Ill.
Crane & Co.	Dalton, Mass.
Crane, Z. & W. M.	Dalton, Mass.
Crocker, McElwain Co.	Holyoke, Mass.
Crown Willamette Paper Co.	San Francisco, Cal.
Crystal Tissue Co.	Middletown, Ohio.
Davey Co.	Jersey City, N. J.
Defiance Paper Co.	Niagara Falls, N. Y.
Dejonge, Louis, & Co.	New York, N. Y.
Dells Paper & Pulp Co.	Eau Claire, Wis.
Dennison Mfg. Co.	Framingham, Mass.
Detroit Sulphite Pulp & Paper Co.	Detroit, Mich.
Dexter, C. H., & Sons, Inc.	Windsor Locks, Conn.
Dexter Sulphite Pulp & Paper Co.	Dexter, N. Y.
Diana Paper Co.	Harrisville, N. Y.
Dill & Collins Co.	Philadelphia, Pa.
District of Columbia Paper Mfg. Co.	Washington, D. C.
Eastern Mfg. Co.	Boston, Mass.
Eddy Paper Corp.	Chicago, Ill.
Edgewater Paper Co.	Menasha, Wis.
Erving Paper Mills	Erving, Mass.
Esleeck Mfg. Co.	Turners Falls, Mass.
Everett Pulp & Paper Co.	Everett, Wash.
Falls Mfg. Co.	Oconto Falls, Wis.
Falulah Paper Co.	Fitchburg, Mass.
Fandango Mills	Millburn, N. J.
Filer Fibre Co.	Filer City, Mich.
Fitchburg Paper Co.	Fitchburg, Mass.
Flambeau Paper Co.	Park Falls, Wis.
Fletcher Paper Co.	Alpena, Mich.
Fort Howard Paper Co.	Green Bay, Wis.
Fort Orange Paper Co.	Castleton, N. Y.
Fox River Paper Co.	Appleton, Wis.
French Paper Co.	Niles, Mich.
Funke, Ferdinand, Sons Co.	Evansville, Ind.
General Paper Co.	New York, N. Y.
Gilbert Paper Co.	Menasha, Wis.
Gilman Paper Co.	New York, N. Y.
Glatfelter, P. H., Co.	Spring Grove, Pa.
Great Western Paper Co.	Ladysmith, Wis.
Groveton Paper Co.	Groveton, N. H.
Gummed Products Co.	Troy, Ohio.

Halifax Paper Corp.,	Roanoke Rapids, N. C.
Hamersley Mfg. Co.	Garfield, N. J.
Hammermill Paper Co.	Erie, Pa.
Hampden Glazed Paper & Card Co.	Holyoke, Mass.
Hampshire Paper Co.	South Hadley Falls, Mass.
Harmon Paper Co.	Brownville, N. Y.
Hawthorne Paper Co.	Kalamazoo, Mich.
Hoberg Paper & Fibre Co.	Green Bay, Wis.
Hollingsworth & Vose Co.	Boston, Mass.
Holyoke Card & Paper Co.	Springfield, Mass.
Howard Paper Co.	Urbana, Ohio.
Hummel-Ross Fibre Corp.	Hopewell, Va.
International Paper Co.	New York. N. Y.
Iroquois Pulp & Paper Co.	Thomson, N. Y.
Jaite Co.	Jaite, Ohio.
Jessup & Moore Paper Co.	Philadelphia, Pa.
Kalamazoo Vegetable Parchment Co.	Kalamazoo, Mich.
Keith Paper Co.	Turners Falls, Mass.
Kerr Paper Mill Co.	East Downingtown, Pa.
Keystone Roofing Co.	York, Pa.
Kimberly-Clark Co.	Neenah, Wis.
Knowlton Bros.	Watertown, N. Y.
Kupfer Bros. Co.	New York, N. Y.
Lewis, J. P., Co.	Beaver Falls, N. Y.
Liberty Paper Co.	Bellows Falls, Vt.
Lincoln Paper Mills	Elkhart, Ind.
Lowe Paper Co.	Ridgefield, N. J.
Mac Sim Bar Paper Co.	Otsego, Mich.
Manchester Board & Paper Co.	Richmond, Va.
Manistique Pulp & Paper Co.	Manistique, Mich.
Marathon Paper Mills Co.	Rothschild, Wis.
Marinette & Menominee Paper Co.	Marinette, Wis.
McIntyre Bros. Paper Co., Inc.	Fayetteville, N. Y.
McLaurin-Jones Co.	Brookfield, Mass.
Mead Pulp & Paper Co.	Dayton, Ohio.
Menasha Printing & Carton Co.	Menasha, Wis.
Merrimac Paper Co.	Lawrence, Mass.
Miamisburg Paper Co.	Miamisburg, Ohio.
Michigan Carton Co.	Battle Creek, Mich.
Michigan Paper Co.	Plainwell, Mich.
Middlesex Products Co.	Boston, Mass.
Mid-States Gummed Paper Co.	Chicago, Ill.
Millers Falls Paper Co.	Millers Falls, Mass.
Missisquoi Pulp & Paper Co.	Sheldon Springs, Vt.
Mohawk Valley Paper Co.	Little Falls, N. Y.
Mohawk Papermakers, Inc.	Cohoes, N. Y.
Mountain Mill Paper Co.	Lee, Mass.
Munising Paper Co.	Munising, Mich.

Nashua Gummed & Coated Paper Co.	Nashua, N. H.
Nashua River Paper Co.	East Pepperell, Mass.
National Metal Edge Box Co.	Philadelphia, Pa.
National Paper Products Co.	San Francisco, Cal.
Neenah Paper Co.	Neenah, Wis.
Nekoosa-Edwards Paper Co.	Port Edwards, Wis.
Newark Paraffine & Parchment Co.	New York, N. Y.
New England Card & Paper Co.	Springfield, Mass.
New Haven Pulp & Board Co.	New Haven, Conn.
New Jersey Coated Paper Co.	Montclair, N. J.
Newton Falls Paper Co.	Newton Falls, N. Y.
New York & Pennsylvania Co.	New York, N. Y.
Norton, C. H., Co.	North Westchester, Conn.
Oglesby, W. B., Paper Co.	Middletown, Ohio.
Ohio Wax Paper Co.	Columbus, Ohio.
Ontonagon Fibre Co.	Ontonagon, Mich.
Oregon Pulp & Paper Co.	Salem, Ore.
Orono Pulp & Paper Co.	Bangor, Me.
Oswego Falls Corp.	Fulton, N. Y.
Otter River Board Co.	Otter River, Mass.
Oxford Paper Co.	New York, N. Y.
Oxford Miami Paper Co.	West Carrollton, Ohio.
Package Paper Co.	Springfield, Mass.
Paraffine Cos., Inc.	San Francisco, Cal.
Parker-Young Co.	Boston, Mass.
Parsons Paper Co.	Holyoke, Mass.
Paterson Parchment Paper Co.	Passaic, N. J.
Patten Paper Co., Ltd.	Appleton, Wis.
Pawtucket Glazed Paper Co.	Pawtucket, R. I.
Peerless Paper Co.	Dayton, Ohio.
Pejepscot Paper Co.	Brunswick, Me.
Peninsular Paper Co.	Ypsilanti, Mich.
Penn Fibre Board Corp.	York, Pa.
Pepperell Card & Paper Co.	East Pepperell, Mass.
Pequannock Valley Paper Co.	Butler, N. J.
Peters Co., Inc.	Brooklyn, N. Y.
Port Huron Sulphite & Paper Co.	Port Huron, Mich.
Price & Pierce, Ltd.	New York, N. Y.
Pynetree Paper Co.	Gordon, Ga.
Racquette River Paper Co.	Potsdam, N. Y.
Rex Paper Co.	Kalamazoo, Mich.
Rexford Paper Co.	Milwaukee, Wis.
Rhinelander Paper Co.	Rhineland, Wis.
Rising, B. D., Paper Co.	Housatonic, Mass.
Riverside Fibre & Paper Co.	Appleton, Wis.
Riverside Paper Mfg. Co.	Glastonbury, Conn.
Rollstone Paper Co.	New York, N. Y.
Ryegate Paper Co.	East Ryegate, Vt.
Safepack Mills	Millis, Mass.
St. Regis Paper Co.	Watertown, N. Y.
Schmidt & Ault Paper Co.	York, Pa.
Scott Paper Co.	Chester, Pa.

Shawmut Waxed Paper Co.	Holliston, Mass.
Shenandoah Pulp Co.	Harpers Ferry, W. Va.
Sherman Paper Co.	Watertown, N. Y.
Smith Paper Co.	Lee, Mass.
Sorg, Paul A., Paper Co.	Middletown, Ohio.
Springfield Glazed Paper Co.	Springfield, Mass.
Standard Paper Co.	Bellows Falls, Vt.
Standard Paper Mfg. Co.	Richmond, Va.
Stevens & Thompson Paper Co.	North Hoosick, N. Y.
Strathmore Paper Co.	Mittineague, Mass
Tanglefoot Co.	Grand Rapids, Mich.
Taylor-Logan Co. Papermakers	Holyoke, Mass.
Thilmany Pulp & Paper Co.	Kaukauna, Wis.
Tidewater Paper Mills	New York, N. Y.
Tissue Co.	Saugerties, N. Y.
Tomahawk Kraft Paper Co.	Tomahawk, Wis.
Tomahawk Pulp & Paper Co.	Tomahawk, Wis.
Tuttle Press Co.	Appleton, Wis.
Underwood Paper Mills, Inc.	Plattsburg, N. Y.
Union Bag & Paper Corp.	New York, N. Y.
Union Mill	Bancroft, Mass.
United Mfg. Co.	Springfield, Mass.
United Paperboard Co.	New York, N. Y.
United States Envelope Co.	Springfield, Mass.
United States Paper Goods Co.	Cincinnati, Ohio.
Upson Co.	Lockport, N. Y.
Walsh Paper Co., Inc.	Cuyahoga Falls, Ohio.
Walther & Co.	New York, N. Y.
Warren, S. D., Co.,	Boston, Mass.
Warren Mfg. Co.	New York, N. Y.
Watab Paper Co.	Sartell, Minn.
Waterfalls Paper Mills	New York, N. Y.
Waterproof Paper & Board Co.	Cincinnati, Ohio.
Watervliet Paper Co.	Watervliet, Mich.
Waterway Paper Products Co.	Chicago, Ill.
Wausau Paper Mills Co.	Brokaw, Wis.
Wausau Sulphate Fibre Co.	Mosinee, Wis.
Waxide Paper Co.	Kansas City, Mo.
West Carrollton Parchment Co.	West Carrollton, Ohio.
West End Paper Co.	Carthage, N. Y.
Westfield River Paper Co.	Russell, Mass.
Weston, Byron, Co.	Dalton, Mass.
Westport Paper Co.	Westport, Conn.
West Virginia Pulp & Paper Co.	New York, N. Y.
Wheelwright, Geo. W., Paper Co.	Leominster, Mass.
Whiting Paper Co.	Holyoke, Mass.
Whiting-Plover Paper Co.	Stevens Point, Wis.
Wolf River Paper & Fibre Co.	Shawano, Wis.
Worthy Paper Co. Association	Mittineague, Mass.
Wrenn Paper Co.	Middletown, Ohio.
Wyomissing Glazed Paper Co.	Reading, Pa.
Wortendyke Mfg. Co.	Richmond, Va.
York Haven Paper Co.	York Haven, Pa.





J. A. Kimberly, President

J. C. Kimberly, Vice-president

D. K. Brown, Treasurer and General Manager

Kimberly Stuart, Secretary

NEENAH
PAPER COMPANY
Neenah, Wisconsin

1878 1978

ORGANIZED in 1885, for the manufacture of book papers, the Neenah Paper Company was later purchased by its present owners and completely remodeled and equipped in 1908, for the manufacture of medium and high grade rag-content papers. Since that time the mill has grown by the addition of new equipment of the most modern sort until its three machines have a capacity of 30 tons of paper a day, confined exclusively to loft-dried, rag-content bonds and ledgers.

It has constantly improved its manufacturing methods to keep pace with the exacting demands of the new automatic appliances in the lithographic and printing fields.

Because of its progressive policies and its care in the manufacture of its products, it has built up a wide reputation for the excellent working qualities of its papers and their exceptional uniformity.

Its mill advertised lines, listed below, all bear the well-known OWL watermark which stands for "Neenah Quality"—a guarantee of satisfaction to an ever-increasing number of customers.

Old Council Tree Bond
Success Bond
Conference Bond

Crystallite Bond | **Chieftain Bond** | **Scottish Crown**
Wisdom Bond | **Glacier Bond** | **Neenah Bond**
Stonewall Ledger

Resolute Ledger | **Prestige Ledger**
Putnam Ledger

Write for Samples

NEENAH PAPER COMPANY

NEENAH, WISCONSIN

1878 1971

One of the committee on organization of the American Paper & Pulp Association, a charter member and secretary thereof during the years 1883-4-5, was Mr. Daniel P. Crocker. He was at that time treasurer and manager of the Crocker Manufacturing Company, of which his father, Mr. Samuel S. Crocker, was president.

In 1877 Mr. Clifton A. Crocker became associated with his brother Daniel P. Crocker in the Crocker Manufacturing Company, and upon his brother's death, on February 10, 1887, became treasurer and manager of the corporation.

In May, 1890, Mr. R. Franklin McElwain became associated with Mr. C. A. Crocker. Soon after, this company purchased what was then known as the old Albion mill, situated closely adjoining their original mill. Between 1892 and 1895 these two mills were consolidated by reconstruction and enlargement into a thoroughly first class mill of that time. The Crocker Manufacturing Company sold their business in 1899 to the American Writing Paper Company, with which company both Mr. Crocker and Mr. McElwain were associated for about three years.

In 1904 the Crocker-McElwain Company was incorporated. This corporation purchased the so-called Cabot Street mill from

· ALBION PAPER COMPANY ·

· CROCKER MANUFACTURING COMPANY ·

· CROCKER-McELWAIN COMPANY

CHEMICAL PAPER MANUFACTURING CO.

the Holyoke Water Power Company, together with the valuable water power connected therewith. This property was converted into a thoroughly up-to-date writing paper plant which went into production in May, 1905. This plant with subsequent additions constitutes what is now the Crocker-McElwain Company's Cabot Street plant.

In 1913, Mr. Crocker and Mr. McElwain, and subsequently the Crocker-McElwain Company, acquired from James H. Newton, et als., the Chemical Paper Company, which had been previously operated by Daniel H., John C., Moses, and James H. Newton. The first development of this plant dates back to the year 1880.

After the acquisition of this mill by the Crocker-McElwain interests the corporation was reorganized under the name of the Chemical Paper Manufacturing Company. This mill, with its additions and improvements, and the subsequent addition to its property of the building on Main Street formerly owned by the United States Envelope Company, constitutes the Chemical Paper Company of to-day. It is one of the largest paper mill plants, with one of the most valuable water powers, in the city of Holyoke.

ESLEECK
Manufacturing Company

TURNERS FALLS, MASS.

Light Weight Papers *made from* High Grade Rags *in a* High Grade Mill

One Fourdrinier Machine, 105" Trim.
Daily Capacity, 6 Tons.

THE SUMMIT OF QUALITY
ESLEECK'S THIN PAPERS
ESLEECK MFG. COMPANY

For the past twenty-seven years we have specialized in the manufacture of High Grade Onion Skin, Manifold and Thin Typewriter Papers (Basis 7¼ to 13 lbs.), made from the best new Rags. They are Thin, Strong and Permanent.

FIDELITY ONION SKIN
PRESTIGE ONION SKIN
MULTIPLE ONION SKIN
RECORDER BOND
VERILITE MANIFOLD
COLLATERAL BOND
EMCO ONION SKIN
SUPERIOR MANIFOLD
ESCOLITE ONION SKIN

Owing to the Legibility, Durability and Permanency of our papers they are entirely satisfactory for copies of Letters, Records and Forms of all kinds.

1878 1977

Oxford Paper Company

Papers of Superior Quality

Oxford Super Calendered Book
Oxford English Finish Book
Oxford Lithograph
Oxford Tablet
Oxford Polar Coated
Oxford North Star Coated
Oxford Dull Finish Coated
Oxford Folding Coated
Oxford Coated One Side Lithograph

Mills at RUMFORD, MAINE

Executive Offices:

200 Fifth Avenue, New York

1878 1978

Founded 1874 - - Incorporated 1877

THE late Seth Wheeler, president of the A. P. W. Paper Co. until his death in 1925, was granted a patent on the first machine to produce perforated roll paper in July, 1871, and began manufacturing in 1874. This machine was originally used to convert wrapping paper rolls and printed the dealer's name on each perforated sheet, but it was soon adapted to run toilet tissue rolls and remained in operation until 1908. The A. P. W. Paper Co. was incorporated in 1877.

A. P. W. Paper Company, Albany, N. Y.

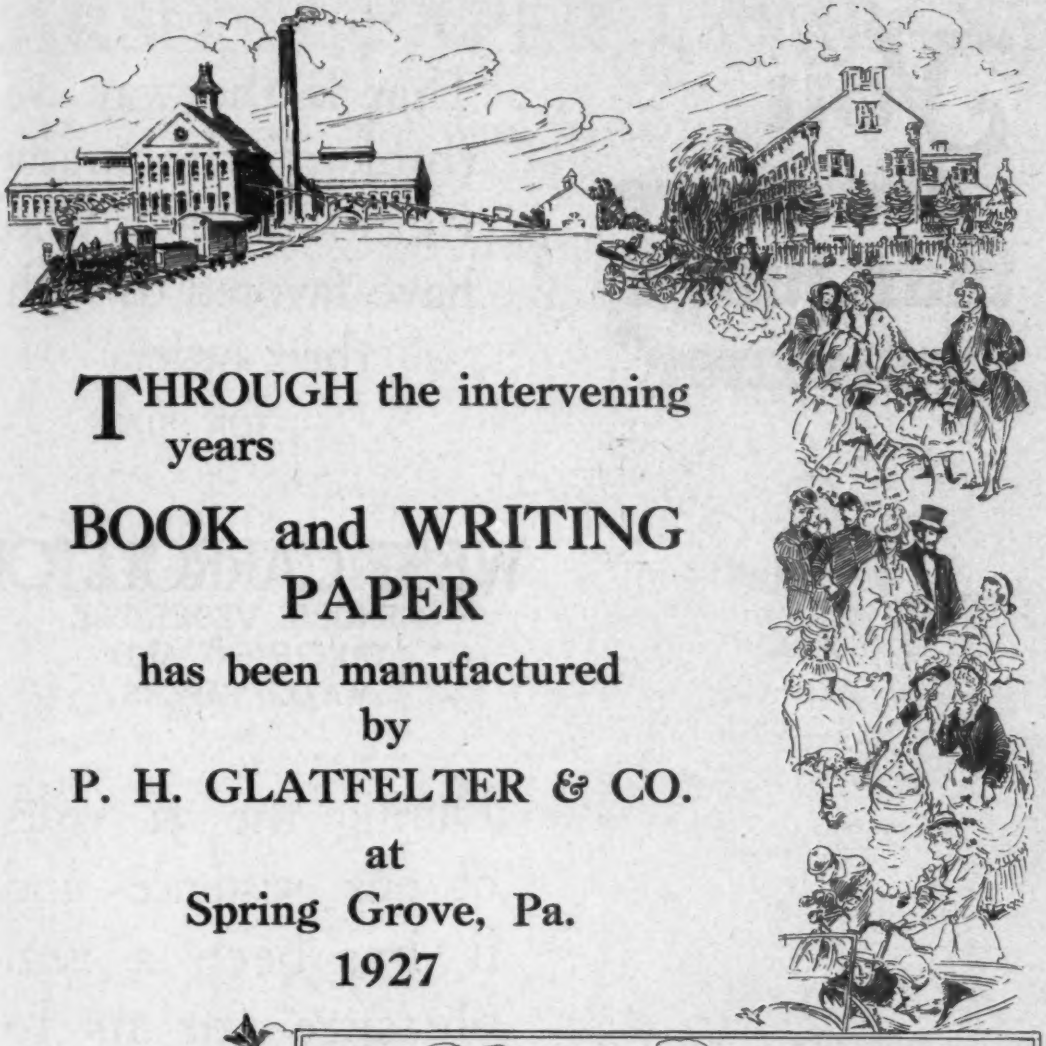
Operating

A. P. W. PULP & POWER CO., LTD.

Manufacturers of Ground Wood Pulp

Sheet Harbour, Nova Scotia

1878 1977



THROUGH the intervening years

BOOK and WRITING PAPER

has been manufactured
by
P. H. GLATFELTER & CO.
at
Spring Grove, Pa.
1927

1878 1927

"You are more than just a Customer"

That is the way we think of the many Paper Merchants who have favored us with their orders *for*

WEST CARROLLTON

GENUINE VEGETABLE PARCHMENT AND WAXED PAPERS

During the 31 years of our existence—and it has been a real pleasure for us to give you service and quality.

The West Carrollton Parchment Co.

West Carrollton, Ohio

1878 1977

PARSONS PAPER COMPANY

Holyoke, Mass.

Makers of the well-known brands of high grade papers:

PARSONS MADE IN U.S.A.

SCOTCH LINEN LEDGER
The Best Paper for Blank Books

DEFENDUM LEDGER
The Popular Paper for Loose Leaf Systems

MERCANTILE RECORD
A Medium Priced Ledger of Good Strength and Color

PARSONS BOND
The Highest Grade Bond Made

PARSONS LINEN
A High Grade Linen with a Distinctive Finish

OLD HAMPDEN BOND
Made in White and Four Colors—Two Finishes—The Paper for Business

MERCANTILE BOND
For General Mercantile Use

IROQUOIS BOND
A Medium Priced Grade

GOTHIC BOND
For High Grade Printing or Lithographing

PARCHMENT BRISTOL
The Strongest Bristol Made

Parsons Papers are standard in their various grades.

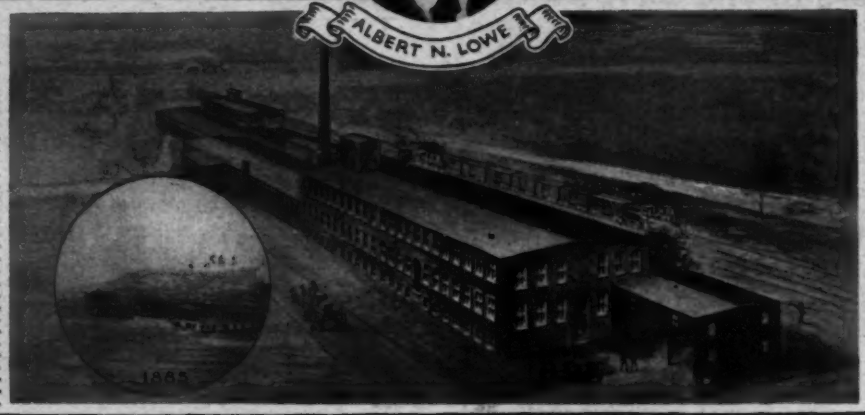
Established 1853

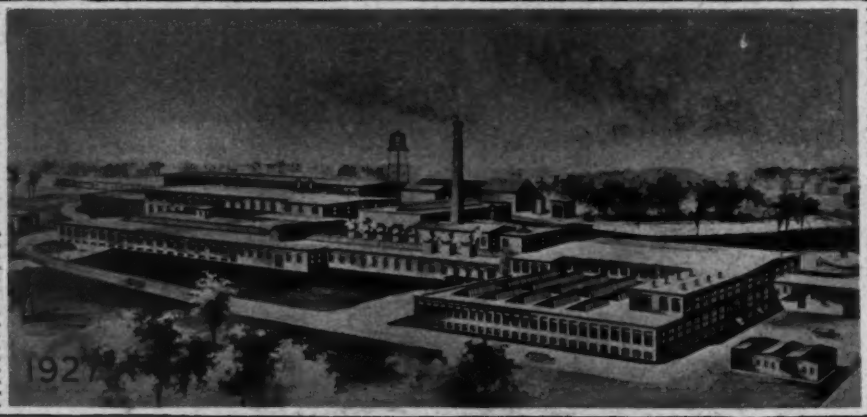
1878 1977

FALPACO

FALPACO

ALBERT N. LOWE





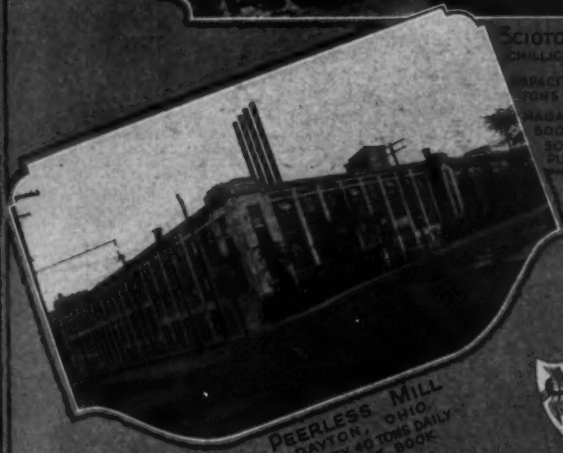
THE FALULAH PAPER COMPANY was founded in 1885 by Albert N. Lowe, who with his uncle Seth L. Lowe bought the plant then known as the Snow Paper Mill. At first the output of the mill was chip board and news board, with a daily production of about ten tons. In 1893 coating machines were installed and the manufacture of coated box board was begun. Later the advisability of making a higher grade product became apparent and about 1905 the manufacture of coated box board was discontinued and the entire attention was concentrated on the making of coated blanks and railroads, which are widely advertised and distributed under the mill brand "Falpaco Coated Cardboard." The daily output now exceeds fifty tons which is over five times the original production of the mill. The officers of the Company are, Erving F. Lowe, President, and Joseph A. Lowe, Secretary and Treasurer; both are sons of the founder of the Company.

FALULAH PAPER COMPANY

FITCHBURG, MASS.

1878 1971

SCIOTO MILL
CHILLICOTHE, O.
CAPACITY 220 TONS DAILY
MAGAZINE, BOOK & SODA PULP



PEERLESS MILL
DAYTON, OHIO.
CAPACITY 90 TONS DAILY
MAGAZINE, BOOK

KINGSPORT MILL
KINGSPORT, TENN.
CAPACITY 115 TONS DAILY
SODA, PULP AND BOOK PAPER

THE MEAD PULP & PAPER CO.

Founded 1846
by
DANIEL E. MEAD

Dayton, Ohio.

MAGAZINE AND BOOK PAPERS

1878 1971

Forty-three Years of Progress

A FEW modest buildings nestling close by the River Rouge was the industry's first picture of the Detroit Sulphite Pulp and Paper Company forty-three years ago ‹ ‹ Today the panorama is greatly changed › › There is now a modern and completely equipped mill, manned by veterans in the craft. There is the largest fleet of boats maintained by any paper manufacturer in the United States. There is a distributor representation covering the entire country. There is a recognized leadership in the production of papers, ranging from a five pound tissue to a three-hundred pound tag-board, by the slow-cooked Mitscherlich sulphite process › › Only one thing—and that the factor which has made such remarkable progress possible—remains from the humble beginnings of 1884. It is the determination of this company to carry into constant practice in all its dealings those high principles which have been fostered by the American Paper and Pulp Association since its inception half a century ago.

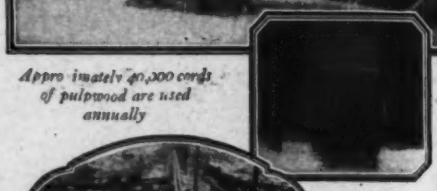
"Makers of Papers of Strength"

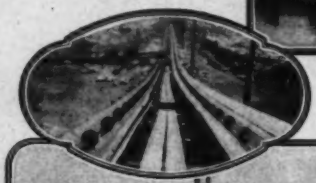
Detroit Sulphite Pulp and Paper Co.

Detroit, Michigan

Included in the standard Detroit line are the following well known papers: Swederope Tag › › Cordova Super Cover and Bristol › › Mitschfibre Stripe › › Mitschfibre M G Tissue › › Oilskin and Platine Tympan › › and Detroit's Die Wiping.

Approximately 40,000 cords of pulpwood are used annually





Bound for the mill

A giant conveyor unloads and builds the mammoth pile of pulpwood in the mill's "front yard"

D.S.P.& P. marine equipment includes one ocean-going steel tug and three steel barges — the country's largest paper mill fleet

Here is a 120-inch Yankee MG machine which keeps production of Detroit's MG Tissue the greatest in North America. There are three other machines of this type, besides a 74-inch Cylinder and an 80-inch Fourdrinier

Modern, improved equipment is found in the beater room, as is the case in every department

1878 1977

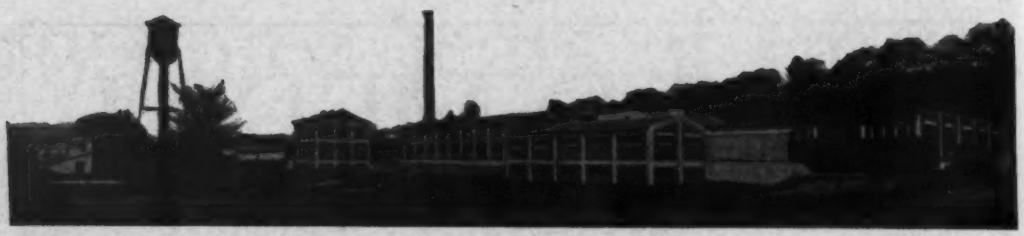
GOLD MEDAL
awarded to
PATERSON
VEGETABLE PARCHMENT

On the Golden Anniversary of the
American Pulp and Paper Association, we
take great pleasure in announcing the award
of the Sesquicentennial Gold Medal to Paterson
Vegetable Parchment as the most efficient protective
wrapper for moist food products, and to Paterson Art
Parchkin as the greatest advancement in the manufacture of
imitation animal parchment for high grade printing and art work.

The Paterson Parchment Paper Co.

Passaic, New Jersey

San Francisco, Calif. **Chicago, Ill.**



Milford Mill of the Warren Manufacturing Company completed 1908 at Milford, N. J.

John L. Riegel,
Founder and President 1889-1893
Director 1873-1893

The Warren Manufacturing Company owns and operates four paper mills, located at Warren Glen, Hughesville, Riegelsville and Milford, all in New Jersey close to the Delaware River and forty miles north of Trenton.

The establishment of the company was mainly the result of John L. Riegel's success with a paper mill of his own, and the Riegels have always devoted their energies to the interests of the company.

The illustration at the top of this page shows the Milford Mill of today, one of the largest and most modernly equipped glassine mills in the country. The bottom illustration shows the original Riegel Mill at Riegelsville, N. J., in operation today, manufacturing many rope and jute specialties.

"Over Fifty Years of Paper Making"

1873 – 1927

The original Riegel Mill, built 1866 by John L. Riegel & Son, at Riegelsville, N. J.

THE J. P. LEWIS CO
BEAVER FALLS, NEW YORK

MANUFACTURERS OF
WOOD FIBRE BOARDS

Board Mills *Hydro-Electric Plant*

The business of the J. P. Lewis Co. was established by the late James P. Lewis forty-five years ago, the original ground wood pulp mill being one of the first to be built in northern New York.

The plant today is a modern three machine mill with a capacity of fifty tons per day of high grade wood fibre boards and forty tons of ground wood pulp. This mill is served by a hydro-electric plant of 7,500 horse power.

1878 1971

An Interesting Study in Contrasts

Century - old ideals being attained by most modern equipment and methods

THE L. L. BROWN PAPER COMPANY of Adams, Mass., commands a prominent place in the fine paper industry not merely because of the age of the company, having been established since 1849, but more especially because this company has been making quality papers *exclusively* for more than three-quarters of a century.

To this company also belongs the enviable record of never having used a scrap of colored rags in its products. Since the original partnership was established 78 years ago, none but WHITE rags have been used. Today it is the only company making ledger, linen and bond papers whose consumption of rags is confined to White clippings.

Largely because of these facts, the name of the L. L. Brown Paper Company has been synonymous for several generations with the highest quality in papers. The L. L. Brown mills were founded primarily for the manufacture of permanent record papers, and have specialized in them ever since. The products are used extensively for public and commercial records, as well as for stationery and important documents of all kinds.

The founders of the company were Levi L. Brown and his uncles, Daniel and William Jenks. The partnership, entered into in 1849, was known as L. L. Brown & Company. The mill in which the new enterprise began operations in these early days consisted of a small brick and wooden structure, occupying part of the site of the present main plant of the company. The productive capacity was limited to 1000 pounds a day. However, this parent mill was very well equipped, according to the standards of the day; and, as with the present mills, was geared for quality primarily.

The quality of the output of the new enterprise rapidly won widespread recognition, with the inevitable result that another building was needed in a very short time. The partnership acquired a large stone cotton mill, nearby, which was remodelled for paper manufacturing. This mill, greatly enlarged and modernly equipped, is now known as the Upper Mill.

Continued growth in the demand for the products of the new partnership, made greater output necessary. Accordingly in 1871 the original mill in which L. L. Brown and his associates began operations was remodelled and greatly enlarged. Since that time both mills, now known as the Upper Mill and the Lower Mill, have been steadily augmented to keep pace with market conditions and manufacturing developments.

In 1873 is was decided to form the business into a corporation to be known as the L. L. Brown Paper Company. Levi L. Brown, one of the original founders, became president, T. A. More, who joined the company as bookkeeper in 1867, was made treasurer. The new company continued the policy of making quality papers exclusively, the principle on which the business was founded nearly a century ago. This policy has long since become a tradition not only with the company, but in the fine paper industry as well.

While the L. L. Brown Paper Company has always specialized in ledger papers, its products also include other lines, notably linens, bonds, parchments, onion skins, exchance cap, manuscript covers and typewriter papers. From the very first, however, chief emphasis has been on record papers, especially those which must endure for unlimited years or which must resist exceptionally severe handling. The products now embrace four ledger grades, two bonds, one linen line and the other grades mentioned.

For many years the L. L. Brown Paper Company had the distinction of being the only mills to manufacture genuine, hand-made paper on a commercial basis. The paper was used for de-luxe editions, engraved and embossed cards and for other exclusive uses. Long after machine made papers had generally come to be used in place of those made by hand, the L. L. Brown Paper Company still had demands for the latter. Having always been known as manufacturers of quality papers exclusively, the company continued to be looked to as the source of supply by those who felt that no paper could be of genuine quality unless it was fabricated manually. To care for this demand, the company maintained a department for this purpose until a comparatively few years ago.

While preserving the traditions on which the company was founded and the spirit of personal craftsmanship which characterized it from the beginning, the L. L. Brown Paper Company has always been among the most progressive in policies and methods. These mills, in fact, form an interesting study in contrasts. There one sees the same conscientious care and thoroughness which formed the nucleus of the enterprise 78 years ago, flourishing alongside the most modern and up-to-date equipment and methods.

The officers of the company are: Arthur B. Daniels, President; A. Millard Daniels, Treasurer; Rupert B. Daniels, Secretary. Mr. Arthur B. Daniels has been identified with the company since 1878.

1878 1927

Marathon Products have the advantages of sixteen years' experience in the manufacture of

Sulphite Bonds

M. G. Wrappings

Light and heavy weight papers for conversion

Food Container Board

Bleached Waxings

Surfacemarked Specialties of all description.

"Best in the Long Run"

Your Inquiries will receive

Immediate attention

MARATHON PAPER MILLS COMPANY

Sales Office:
1126 Conway Building
Chicago, Illinois.

J. R. Russell, Sales Mgr.

Mills at
Rothschild,
Wisconsin

1878 1927

CENTRAL PAPER COMPANY

MUSKEGON, MICHIGAN

Kraft

Felt Stripes

All Sulphites

Central Parchment

Light Weight Bonds

Printed Papers

Iama Paper Towel Rolls and Sheets

Specialties

Sole Sales Agents

MANUFACTURERS PAPER COMPANY

Chicago NEW YORK Boston

Bleached and Unbleached Sulphite Pulp Sulphate Pulp

Daily Paper Production 120 Tons.

1878 1977

Specialties

IN A BUSINESS so diversified, it is always difficult to keep the range of our activities before the Trades. For instance, not all of our friends are familiar with our facilities and increasing interest in the manufacture of paper for *special* uses. Among such papers are:

Pure kraft papers for conversion
Semi-kraft papers for conversion
Striped, colored and imprinted papers
Papers for twisting
High grade mill wrappers—natural colors and colored
Supercalendered white and colored papers
Individually striped and imprinted papers for textile wrappers
Unbleached sulphite papers for special uses

Trained papermakers and extensive equipment are available to handle individual problems. Inquiries on special requirements will receive prompt attention.

In addition to these papers, Union products include a complete line of Grocers and Odd Bags, and such Special (made-to-order) Bags as Carton-Liner, Candy, Notion, Bread, Sandwich, Pastry, Cake, Doughnut, Glassine, Potato Chips, Peanut, Bacon and Lard Liner, Nail, Sugar, Banana, Millinery, Shirt, Shirtwaist; Handle, Garment and Cigar and Tobacco Bags; *The* UNION DUPLEX COFFEE BAGS; *The* UNION SHOPPING BAG. Paper Sacks for Flour, Cereals, Meals, Feeds, Coal, Charcoal, Kindling Wood, Garden Truck, Fertilizer, Lime, dry Chemical Products, etc., etc.

The value of a paper bag is measured by the service it renders—not by its COST

TRADE MARK UNION

UNION BAG & PAPER CORPORATION

Manufacturers of Pulp, Wrapping Paper, Paper Bags & Paper Sacks

GENERAL OFFICES ▪ WOOLWORTH BUILDING ▪ NEW YORK CITY

1878 1927

Felix Pagenstecher, President

W. B. Milham, Vice-President

C. A. Fox, Secretary and Treasurer
P. C. Servaas, Sales Manager.

BRYANT PAPER COMPANY

Kalamazoo, Michigan

DAILY CAPACITY

300 TONS

BRYANT DIVISION

Super-Calendered and Machine Finished
Book Papers

SUPERIOR DIVISION

Light Weight and Catalog Paper

MILHAM DIVISION

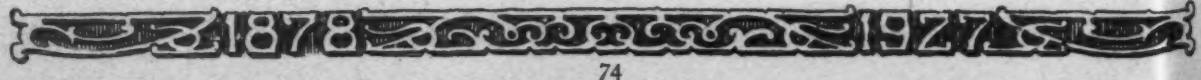
British Opaque
English Finish Opacity

IMPERIAL DIVISION

Surface Coated Papers

Specialists in Light Weight Papers

For Mail Order Catalogues



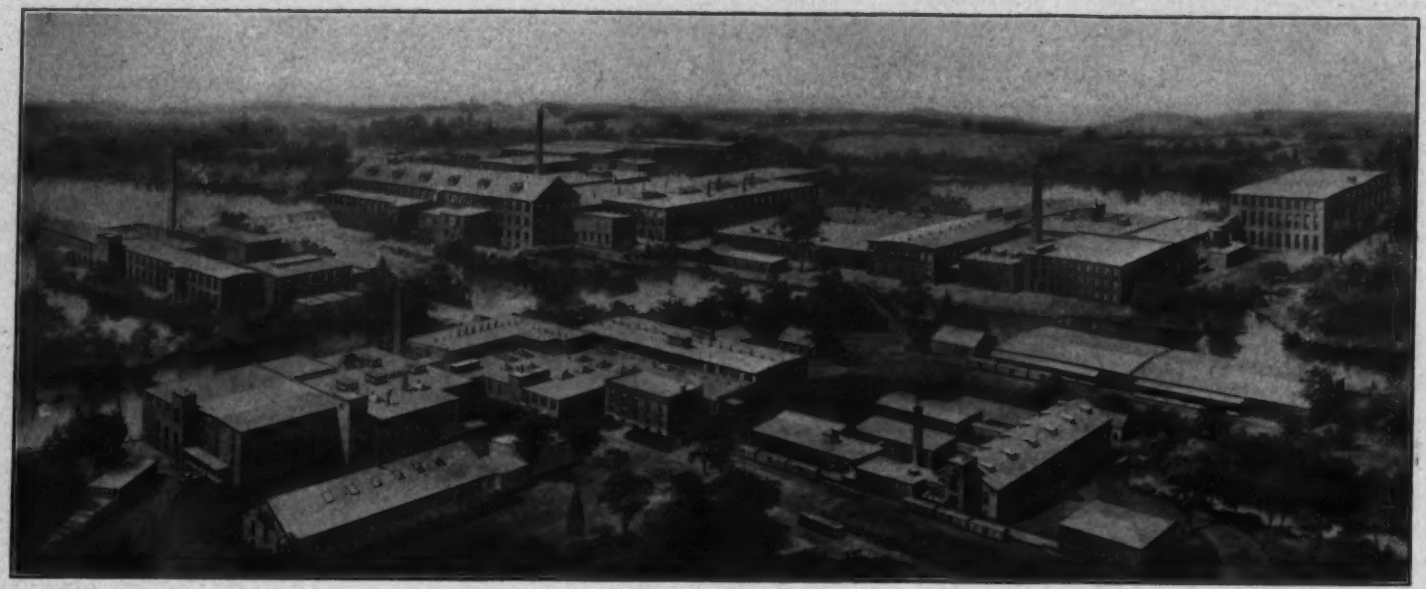
The
PARKER-YOUNG COMPANY
Paper Manufacturers

SULPHITE BOND
WRITINGS
GROUNDWOOD TABLET
HALFTONE
HIGH GRADE MANILAS
FOLDER STOCK
ENVELOPE PAPER

A Permanent and Reliable Source of Supply

Pulp and Paper Mills at
LINCOLN, N. H.
Sales Offices at
131 STATE STREET, BOSTON, MASS

1878 1977



FINE TISSUE PAPERS

CARBON
CONDENSER
CIGARETTE
NITRATING
SILVER
INDIA BIBLE

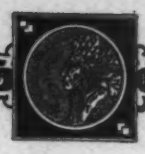
THE SMITH PAPER COMPANY

LEE, MASSACHUSETTS, U. S. A.

ORGANIZED 1866

PRESENT OFFICERS

NORVAL H. BUSEY, JR., PRESIDENT
GILBERT L. CLARK, VICE-PRESIDENT
WELLINGTON SMITH, SECRETARY
CHARLES J. DONAHOE, TREASURER



HOWARD BOND

WATERMARKED

"THE NATION'S BUSINESS PAPER"

PAPER MERCHANTS

ALBANY
Potter-Taylor Paper Corporation.
ALLENTOWN, PA.
Kemmerer Paper Company.
ATLANTA
Louisville Paper Company.
BALTIMORE
B. F. Bond Paper Company.
BINGHAMTON, N. Y.
Stephens & Company.
BOSTON
John Carter & Co., Inc.
Arthur E. Ham & Son.
BROOKLYN
General Paper Goods Mfg. Co. (Env.)
CHICAGO
Midland Paper Company.
Parker, Thomas & Tucker Paper Co.
CINCINNATI
The Chatfield & Woods Company.
CLEVELAND
The Cleveland Paper Mfg. Co.
COLUMBUS, OHIO
The Diem & Wing Paper Co.
CONCORD, N. H.
John Carter & Co., Inc.
DAYTON, OHIO
The Buyer's Paper Company.
Reynolds & Reynolds Co. (Tablets).
DETROIT
Chope-Stevens Paper Co.
GRAND RAPIDS, MICH.
Quimby-Kain Paper Co.
HARRISBURG, PA.
Donaldson Paper Co.
HARTFORD, CONN.
John Carter & Company, Inc.
INDIANAPOLIS, IND.
C. P. Lesh Paper Co.
KALAMAZOO, MICH.
Bermingham & Prosser Co.
LOS ANGELES
Pacific Paper & Envelope Corp.
LOUISVILLE, KY.
Louisville Paper Co.
MEMPHIS, TENN.
Louisville Paper Co.
MILWAUKEE, WIS.
W. F. Nackie Paper Co.
MINNEAPOLIS, MINN.
Wilcox-Mosher-Leffholm Co.
MONTREAL
McFarlane, Son & Hodgson.
NEW ORLEANS
The Diem & Wing Paper Co.
NEWARK, N. J.
J. E. Linde Paper Co.
NEW YORK CITY
Allan & Gray.
H. P. Andrews Paper Co.
Babrenburg Paper Corporation.
J. E. Linde Paper Co.
M. & F. Schlosser.
White-Burbank Paper Co.
OMAHA, NEBR.
Marshall Paper Co.
PATERSON, N. J.
Paterson Card & Paper Co.
PEORIA, ILL.
John C. Streibich Co.
PHILADELPHIA, PA.
Garrett-Buchanan Co.
PITTSBURGH, PA.
The Chatfield Woods Co.
PROVIDENCE, R. I.
John Carter & Co., Inc.
PUEBLO, COLORADO
The Colorado Paper Co.
RICHMOND, VA.
Virginia Paper Co.
SAN FRANCISCO
Norman F. Hall Co.
SIOUX FALLS, S. D.
Sioux Falls Paper Co.
SEATTLE
Paper Mills Agency.
SYRACUSE, N. Y.
J. & F. B. Garrett Co.
SPRINGFIELD, MASS.
John Carter & Co., Inc.
TOLEDO, OHIO
The Ohio & Michigan Paper Co.
TORONTO
Barber Ellis Company.
VANCOUVER, B. C.
Columbia Paper Co.
VICTORIA, B. C.
Columbia Paper Co.
WASHINGTON, D. C.
Virginia Paper Co.
WEST CARROLLTON, OHIO
American Envelope Co. (Env.).
WINNIPEG
Barkwell Paper Co.

Write for samples of

HOWARD BOND — HOWARD LAID BOND
HOWARD ENVELOPES — HOWARD LEDGER
HOWARD WHITE AND BUFF POSTING LEDGER

Also portfolio of letterheads, envelopes and forms

THE HOWARD PAPER CO. — **URBANA, OHIO**

New York Office
280 Broadway

Chicago Office
10 La Salle St.

COMPARE IT - TEAR IT - TEST IT - AND YOU WILL SPECIFY IT

1878 1977

WYOMISSING

GLAZED PAPER COMPANY

INCORPORATED

ART LABEL PAPERS

NON-CURLING FLINT GLAZED

FRICTION GLAZED

PLATED

READING PENNSYLVANIA

1878 1977

THE 4 GROUPS OF RISING PAPERS

The Business Group

BONDS

Housatonic Bond
Barrington Bond
Danish Bond
Finance Bond
Initial Bond
Triplico Bond

LINENS

Twenty Carat Linen
Barrington Linen
Danish Linen
Superscript

LEDGERS

Reference Linen Ledger
Danish Ledger
Finance Linen Ledger
Initial Ledger

The Bristol Group

INDEX BRISTOLS

Danish No. 1 Index
Ragstock Index
Initial Index

WEDDING BRISTOLS

Housatonic Engravers Board
Winter White Wedding Bristol
Danish Pasted Bristol
Finance Pasted Bristol
Initial Pasted Bristol
Fiscal Pasted Bristol

Superfine papers in 22 x 34 to match the above bristols

The Announcement Group

Platinum Vellum
Housatonic Vellum
Barrington Vellum
Danish Vellum
Initial Vellum
Spinnet Vellum

Ridgemark Deckledge
Twenty Carat Linen
Danish Kashmir Korrespondence
Little Ridge Deckledge

The Cover and Booklet Group

Danish Kashmir Cover

Ridgemark Deckledge (double thick)

Little Ridge Deckledge (double thick)

Twenty Carat Linen (double thick)

Bond-Circular Wedding

Superscript Wove and Laid

Envelopes and announcements made from the above papers by the Old Colony Envelope Company.

ALL THESE PAPERS ARE IN THE BROAD SENSE BUSINESS PAPERS. THE ANNOUNCEMENT AND BOOKLET PAPERS SECURE BUSINESS; THE BOND AND LINEN PAPERS TRANSACT IT; THE LEDGERS AND INDEXES RECORD IT.

THESE PAPERS DO THEIR WORK SUPREMELY WELL

Manufactured by

B. D. RISING PAPER CO. UNIFORMITY R

B. D. RISING PAPER COMPANY

Housatonic, Berkshire County, Massachusetts

USE BETTER PAPERS FOR GREATER PROFIT AND INFLUENCE — THE BEST PAPERS ARE MADE FROM RAGS

Distributed by

ALBANY, N. Y.....Hudson Valley Paper Co.
BALTIMORE, MD.....B. F. Bond Paper Co.
BOSTON, MASS.....Carter, Rice & Co.
BOSTON, MASS.....Cook-Vivian Co., Inc.
BOSTON, MASS.....Storrs & Bement Co.
BUFFALO, N. Y.....The Alling & Cory Co.
CHICAGO, ILL.....Messinger Paper Co.
CHICAGO, ILL.....Midland Paper Co.
CHICAGO, ILL.
Parker, Thomas & Tucker Paper Co.
CLEVELAND, OHIO
The Central Ohio Paper Co.
COLUMBUS, OHIO
The Central Ohio Paper Co.
DETROIT, MICH.....Beecher, Peck & Lewis
GREENSBORO, N. C.....Dillard Paper Co.
HOUSTON, TEXAS..The Paper Supply Co.
JACKSONVILLE, FLA.
Knight Brothers Paper Co.
LOS ANGELES, CALIF.
Blake, Moffitt & Towne
LOUISVILLE, KY.....Louisville Paper Co.
MIAMI, FLA.....Knight Brothers Paper Co.
MINNEAPOLIS, MINN.
Swartwood-Nelson Paper Co.
NEW HAVEN, CONN..Storrs & Bement Co.
NEW YORK CITY
Miller & Wright Paper Co.
NEW YORK CITY.....M. & F. Schlosser
PHILADELPHIA, PA..Garrett-Buchanan Co.
PITTSBURGH, PA...The Alling & Cory Co.
PORTLAND, ORE.....Blake, McFall Co.
RICHMOND, VA...B. W. Wilson Paper Co.
ROCHESTER, N. Y..The Alling & Cory Co.
SACRAMENTO, CALIF.
Blake, Moffitt & Towne
SALT LAKE CITY, Carpenter Paper Co.
SAN ANTONIO, TEXAS
San Antonio Paper Co.
SAN FRANCISCO, CAL.
Blake, Moffitt & Towne
SEATTLE, WASH..Mutual Paper Corporation
SPRINGFIELD, MASS.
The Paper House of N. E.
ST. LOUIS, MO.....Beacon Paper Co.
ST. LOUIS, MO.....Mack-Elliott Paper Co.
ST. LOUIS, MO.....Seaman Paper Co.
TACOMA, WASH..Tacoma Paper & Sta'ry Co.
TAMPA, FLA.....Knight Brothers Paper Co.
TOLEDO, OHIO.The Central Ohio Paper Co.
TROY, N. Y.....Troy Paper Corporation
WASHINGTON, D. C. F. T. Parsons Pa. Co.
EXPORTERS
NEW YORK CITY
American Paper Exports, Inc.
NEW YORK CITY..A. M. Capen's Sons, Inc.

1878 1927

J. E. CAMPBELL, *Pres. & Treas.* H. A. LONG, *Secretary*

C. W. CAMPBELL, *Vice-Pres. & Genl. Mgr.*

DEXTER SULPHITE PULP & PAPER COMPANY

Dexter, Jefferson County, New York

Manufacturers

Original Process Mitscherlich Unbleached Sulphite Pulp.
Mitscherlich Sulphite Paper Specialties
and Papers of Exceptional Strength

Sign
Wrapping
Twisting
Bag Paper
Meat Wrap
Colored Specialties
Grocers' and Millinery Bags

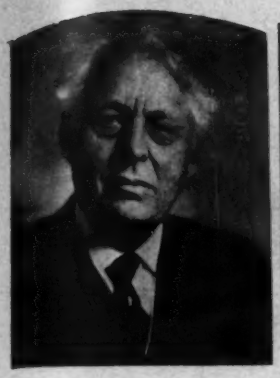
Daily Capacity

65 Tons Mitscherlich Sulphite

10 Tons Ground Wood Pulp

5,000,000 Bags

35 Tons Paper



Geo. A. Whiting
President

Plant of the Whiting-Plover Paper Company, Stevens Point, Wisconsin

F. B. Whiting,
Vice-President

E. A. Oberweiser
Secy.-Treasurer

MILL BRANDS:

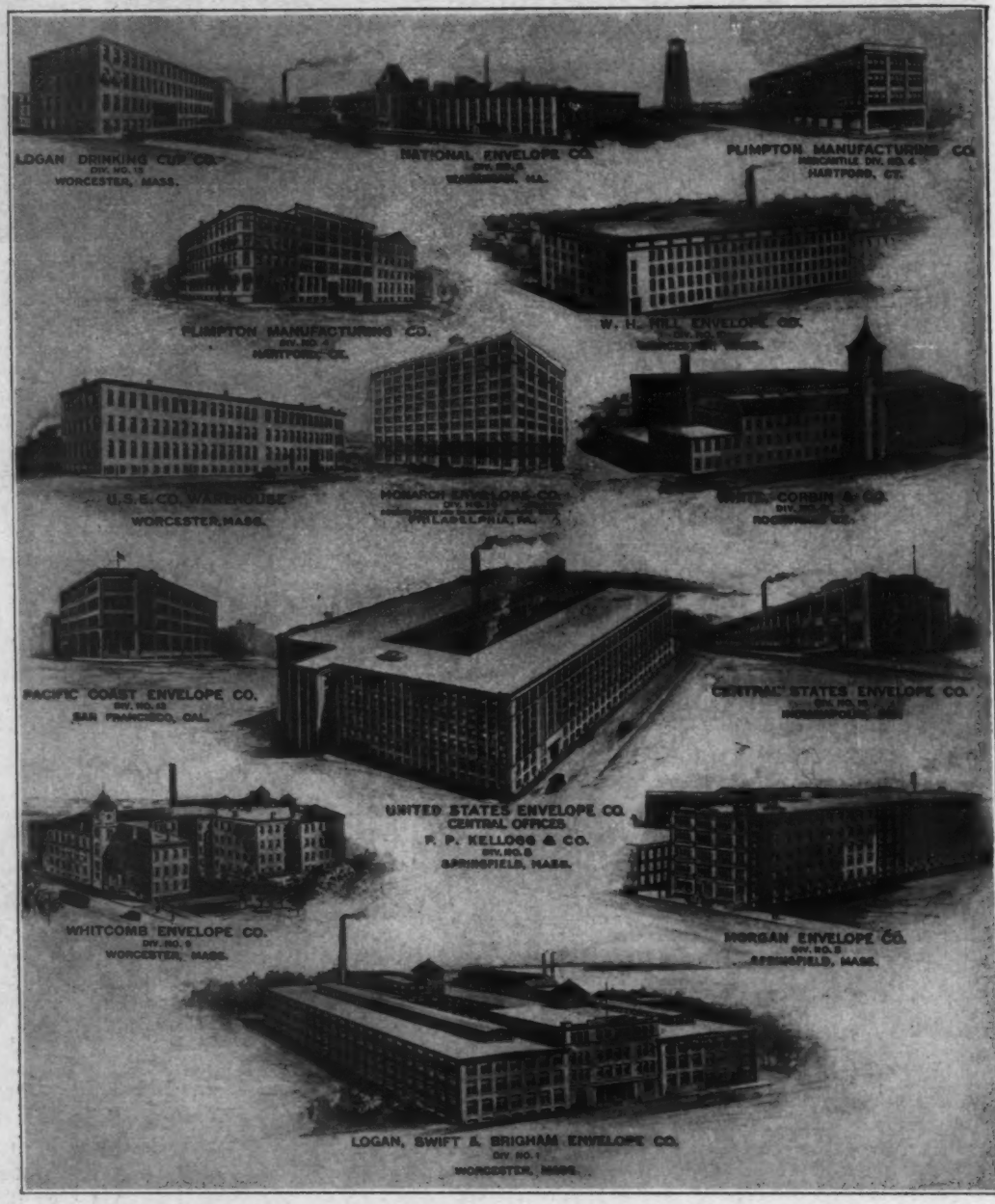
PLOVER LINEN BOND
OLD RELIABLE BOND
INTERNATIONAL BOND
FORTIFIED BOND
ARTESIAN BOND
REDEMPTION BOND
FORTIFIED LEDGER
ARTESIAN LEDGER

THE Whiting-Plover Paper Company was founded by Geo. A. Whiting in 1893, and Mr. Whiting is still active in the business as president. This mill while designed by Mr. Whiting thirty-four years ago, is still considered a model for efficient lay-out.

One of the most valuable assets of the company is its ample supply of spring water, which is used in all of the mill's manufacturing processes, as well as for drinking purposes. It is extremely soft, and is absolutely without color, taste, odor or sediment, and is undoubtedly the largest factor in the company's present reputation for producing papers unparalleled for color and uniformity. Large quantities of this water have been shipped various individuals under their physician's prescription where the purest natural water was indicated for the treatment of certain ailments.

Recognizing the fact that clean paper can be made only in a clean mill, no expense or effort is spared to keep the plant in the cleanest possible condition, and it is found that the large expenditure of time and money is more than compensated for by the reputation for quality and cleanliness earned by the papers produced under such conditions.

Officers and executive personnel comprise the following:—George A. Whiting, President; F. B. Whiting, V. P.; E. A. Oberweiser, Sec.-Treas. and Gen. Manager; C. W. Spickerman, Sales Mgr.; J. H. Miller, Asst. Mgr. and Pur. Agt.; F. B. Shemanski, Mgr. Cost Dept.; M. W. Hanna, in charge of orders and inventories; J. A. Adams, superintendent.


LOGAN DRINKING CUP CO.
DIV. NO. 12
WORCESTER, MASS.
NATIONAL ENVELOPE CO.
DIV. NO. 5
SPRINGFIELD, MA.
PLIMPTON MANUFACTURING CO.
MERCANTILE DIV. NO. 4
HARTFORD, CT.
PLIMPTON MANUFACTURING CO.
DIV. NO. 1
HARTFORD, CT.
W. H. HILL ENVELOPE CO.
U.S.E.CO. WAREHOUSE
WORCESTER, MASS.
MONARCH ENVELOPE CO.
DIV. NO. 11
PHILADELPHIA, PA.
WM. E. CORBIN & CO.
DIV. NO. 2
ROCHESTER, N.Y.
PACIFIC COAST ENVELOPE CO.
DIV. NO. 13
SAN FRANCISCO, CAL.
CENTRAL STATES ENVELOPE CO.
DIV. NO. 14
INDIANAPOLIS, IND.
UNITED STATES ENVELOPE CO.
CENTRAL OFFICES
P. P. KELLOGG & CO.
DIV. NO. 6
SPRINGFIELD, MASS.
WHITCOMB ENVELOPE CO.
DIV. NO. 9
WORCESTER, MASS.
MORGAN ENVELOPE CO.
DIV. NO. 3
SPRINGFIELD, MASS.
LOGAN, SWIFT & BRIGHAM ENVELOPE CO.
DIV. NO. 1
WORCESTER, MASS.

COLUMBIAN *Improved* CLASP ENVELOPES

The Best Mailing Envelope on the Market.

COLUMBIAN *White* USE *Wove* ENVELOPES

The Standard White Wove Envelope

GOOD ENVELOPES OF ALL KINDS

Papeteries --- Drinking Cups --- Toilet Papers

UNITED STATES ENVELOPE COMPANY,
SPRINGFIELD, MASS.

The Largest Envelope Manufacturers in the World, with Fourteen Manufacturing Divisions Covering The Country.

DIVISION	LOCATION	DIVISION	LOCATION
LOGAN, SWIFT & BRIGHAM ENV. CO., DIV.	WORCESTER, MASS.	WHITCOMB ENVELOPE CO., DIV.	WORCESTER, MASS.
WHITE, CORBIN & CO., DIV.	ROCKVILLE, CONN.	W. H. HILL ENVELOPE CO., DIV.	WORCESTER, MASS.
PLIMPTON MANUFACTURING CO., DIV.	HARTFORD, CONN.	MORGAN TISSUE PAPER CO., DIV.	SPRINGFIELD, MASS.
MORGAN ENVELOPE CO., DIV.	SPRINGFIELD, MASS.	PACIFIC COAST ENVELOPE CO., DIV.	SAN FRANCISCO, CAL.
NATIONAL ENVELOPE CO., DIV.	WAUKEGAN, ILL.	CENTRAL STATES ENVELOPE CO., DIV.	INDIANAPOLIS, IND.
MORGAN STATIONERY CO., DIV.	SPRINGFIELD, MASS.	MONARCH ENVELOPE CO., DIV.	PHILADELPHIA, PENN.
P. P. KELLOGG & CO. DIV.	SPRINGFIELD, MASS.	LOGAN DRINKING CUP CO., DIV.	WORCESTER, MASS.

1878 1927

MILLS, WEST VIRGINIA PULP AND PAPER CO.

History of the West Virginia Pulp & Paper Co.

IN 1826, John Luke completed his apprenticeship in a paper mill in Scotland and received his certificate of proficiency as a paper maker. Several years later he established his own paper mill at the Crook-of-Devon, Scotland, which he operated up to the time of his death.

In 1852, John Luke's son, William, then twenty-three years of age, came to the United States and engaged with various American paper mills until 1888. He then established the nucleus of the present great company, taking with him his two sons, John G. and David L. Luke, both of whom had by that time gained valuable experience in the paper industry.

This first organization, known as the Piedmont Pulp & Paper Company, was chartered by West Virginia certificate October 19, 1888, and is generally recognized as pioneer in the successful production of sulphite pulp. The officers were: William Luke, president; John G. Luke, vice-president and general manager; and David L. Luke, secretary and treasurer.

In 1891, a second company—the West Virginia Paper Company—was formed and a plant erected at West Piedmont with accommodations for two paper machines. At first only one machine was put in operation, a Fourdrinier with 92-inch wire, for manufacturing Manila wrapping paper.

Consolidation

The following year a third company—the West Virginia Pulp Company—was incorporated and a sulphite plant built at Davis, West Virginia. The grade of product was changed from Manila to book paper about 1893. In 1897 the three corporations above named were consolidated under the name of the West Virginia Pulp & Paper Company, the officers being the same as those of the original company.

From time to time, additional paper machines have been installed and new mills erected, until today the Luke Plant, formerly the West Piedmont plant, consists of a seven-machine paper mill, a soda pulp mill, a rag plant and a coating mill. Steady expansion of the business continued and, in 1899, the West Virginia Pulp & Paper Company acquired the plant of the Morrison & Cass Paper Company of Tyrone, Pa., consisting of a soda pulp mill and a paper mill. This is now the Tyrone Mill, a four-machine plant.

The next step was the construction of the Covington Plant, at Covington, Va., which was begun in 1899. This plant consists of a sulphite pulp mill, a soda pulp mill, a pulp products mill for manufacturing paper board and six-machine paper mill.

In 1904, the Duncan Mill at Mechanicville, N. Y., was added to the West Virginia Pulp & Paper Company. It comprised a sulphite pulp mill, a soda pulp mill and a six-machine paper mill. In 1906 the company acquired the Williamsburg Paper Manufacturing Company at Williamsburg, Pa., consisting of a soda pulp mill and a two-machine paper mill.

Remarkable Growth

In addition to its pulp and paper mills, the company built mills at Spruce, West Virginia, and Cass, West Virginia, for the conversion of logs into pulp wood and lumber; all of the logs going into these two mills being cut from the company's own timber lands. The company also owns a very considerable boundary of coal lands which is gradually being developed and from which a large percentage of its present coal supply is being mined.

In 1891, the single 92-inch paper machine had an output of about fifteen tons a day. In 1910, the twenty-three paper machines of the company produced over 500 tons a day. Today the seventeen mills of the West Virginia Pulp & Paper Company produce more than 1,400 tons of pulp and paper every twenty-four hours.

The products of the West Virginia Pulp & Paper Company consist of Super Calendered and Machine Finished Book and Lithographic Papers, Antique Bulking Papers, Offset, Index Bristol, Postcard, Bond and Writing Papers, Envelope and Music Papers, Enameled Book and Lithographic Papers and Kraft Papers. From the very first the company has been under the guidance of William Luke, son of John Luke, the Scotch paper craftsman, and of William Luke's sons, who are now in active management of the corporation. The business has been one of steady growth.

The present officers and directors of the company are: David L. Luke, president; Thomas Luke, vice-president; George E. Nelson, vice-president; John R. Miller, vice-president; Adam K. Luke, treasurer; Charles A. Cass, secretary; Henry L. Condit, assistant secretary; and Joseph K. Cass, Edward L. Ballard, John C. Duncan, David L. Luke, Adam K. Luke, William A. Luke, Thomas Luke and George E. Nelson, directors.

Original MITSCHERLICH Process

for

40 YEARS

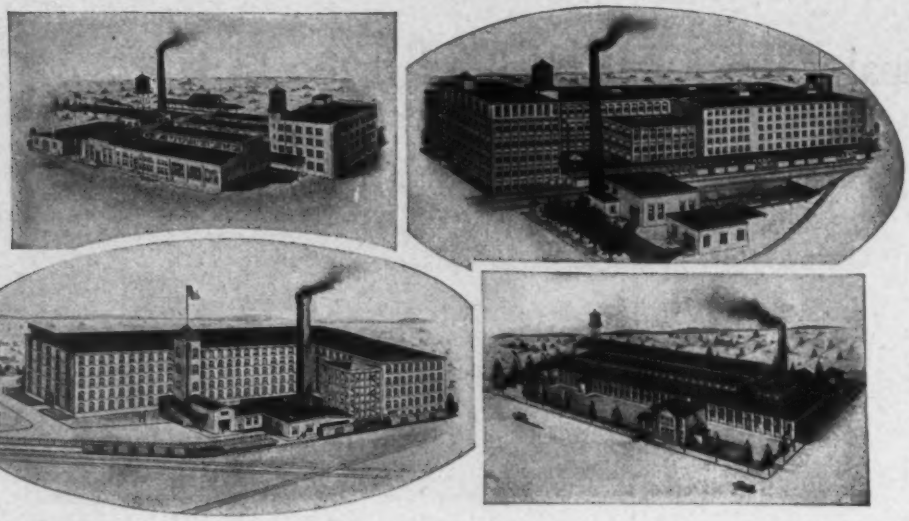
PORT HURON SULPHITE and PAPER CO.
Port Huron, Mich.

Machine Glazed
Papers

Cylinder
Papers

1887 1927

1878 1977



Looking backward! — & *forward*

The officers of this company extend their felicitations to the Association on its 50th Anniversary.

Winthrop L. Carter, President
Vasco E. Nunez, Vice-President
Eliot A. Carter, Treasurer
George H. Lowe, Secretary

Playing leap frog with the years is an unavoidable incident. Count not the years but the PROGRESS. We believe, and our retrospection covers 80 years—back to the days of hand coloring and flint stick calendering, that our industry has kept fully abreast of the times.

The past, they say, indicates the future. We intend to do our share of incessant research—chemical and mechanical—that the industry may be lifted to an even higher plane.

NASHUA GUMMED & COATED PAPER CO.

NASHUA, N. H.

Mills
NEW HAMPSHIRE OHIO CANADA

Sales Offices

NASHUA, N. H.
BOYCE BLDG., CHICAGO
MIDDLETOWN, OHIO
PETERBORO, ONT.
250 WEST BROADWAY, N. Y. CITY
RAILWAY EXCHANGE BLDG., PORTLAND, ORE.
CORISTINE BLDG., MONTREAL
WIDENER BLDG., PHILADELPHIA
UNDERWOOD BLDG., SAN FRANCISCO
KING ST., EAST, TORONTO
HELLMAN BLDG., LOS ANGELES

1878 1977

MARTIN CANTINE AND HIS PAPERS

IT is given to some men to be pioneers; to have dreams, hopes, aspirations and the indomitable perseverance to make them realities. To say that anybody had a perfect vision forty years ago of the tremendous use to which coated papers are put today would, of course, be an exaggeration. No one foresaw at that time the astounding advances which were destined to be made in the various processes of artistic reproduction and printing. Many of them were still in the crudest stages of experimentation, being weighed in the balance of practicability. Others were quite unthought of. But one of the marks of a true pioneer is his determination to go on though the way ahead is none too clear and behind, less courageous souls are beckoning a return.

Thus it was with Martin Cantine in 1888, when he bought out the old Adams Card Company of Albany, N. Y., and moved the equipment to Saugerties. At the outset he subscribed to the simple old philosophy that it pays to do one thing exceptionally well. And in developing the business he has never wavered from the belief that co-operation is more satisfactory than coercion, that it is better to lead a group of men than it is to drive them. Largely upon these two basic tenets the enterprise has grown to its present, well-known position in the paper industry—"The Tiffany of paper coaters," as it is often referred to.

While Mr. Cantine has devoted his life to the art of paper coating, the closely allied art of printing has long been one of his hobbies. He seems to be as well informed on the history, development and modern methods of printing as he is on the coating of papers—his lifelong study.

Martin Cantine's first plant had a capacity of two and one-half tons of coated paper a day. His original crew of workers numbered thirteen. From this modest beginning the business has grown steadily to its present size a working force of four hundred with a daily capacity of between seventy-five and a hundred tons.

To become the largest producer of coated papers in the country would have been a laudable enough ambition for most men. But its achievement alone, would never have satisfied Martin Cantine. From the beginning, his interest has been centered on the **quality** of his papers. Early and wisely he reasoned that an ample volume would inevitably come if the printing surfaces of Cantine papers were the finest that could be produced. Not simply good enough to meet a demand, but so extraordinarily fine that they would create a demand, by virtue of the impressive printing which they made possible.

And so it has come about. Martin Cantine invested his life in what to him is a fine art. Probably the greatest return he has received from the investment is his realization of the part that Cantine papers are playing today in the production of really fine printing.

THE MARTIN CANTINE CO.

Manufacturers of Coated Papers

SAUGERTIES, N. Y.

New York Sales Office: 501 Fifth Ave.

MILTON E. MARCUSE
President

ISAAC J. MARCUSE
Vice-President

ALEXANDER J. MARCUSE
Treasurer

MOSES M. MARCUSE
Secretary

BEDFORD PULP & PAPER CO.
INCORPORATED

Paper and Pulp Mills of Bedford Pulp & Paper Co., Inc., at Big Island, Va.

Manufacturers of

BUTCHER'S FIBRE

Pine-Wood Board For Corrugating

Special Papers for Fibre Containers

General Offices: RICHMOND, VA.

Paper and Pulp Mills at Big Island and Coleman Falls, Va.

1878 1977

BUCK-McRAE ELECTROLYTIC CELL

History

This Electrolytic Cell was developed by practical men having years of experience and with the following objects in view:

1.—Reducing Floor Space.

2.—Eliminating Graphite Fabrication and the attending evils of joined graphite.

3.—Reducing Graphite Consumption.

4.—Eliminating Solution Leakage from the Cell.

The first cell was built and placed in operation, September of 1919, and cells of the same type have been in operation ever since. During the development of the Buck-McRae Cell it became apparent that the most important feature was one which before operation had not been apparent, namely:

5.—Low Power Consumption.

No chlorine consumer can afford not to investigate this merit as it means a large return on a replacement installation and a larger return on a new installation.

The Buck-McRae Cell has recently replaced a well-known type of cell in one large plant and the savings in power alone will pay for the change in nine months.

Comparative Data

Below is illustrated diagrammatically the above mentioned points with the Buck-McRae Cell and another well-known cell.

POWER CONSUMPTION (at 1500 amp.)

Buck-McRae 5.4 K.W.

Another Cell 6.3 K.W.

GRAPHITE COST (per 2000 lb. chlorine)

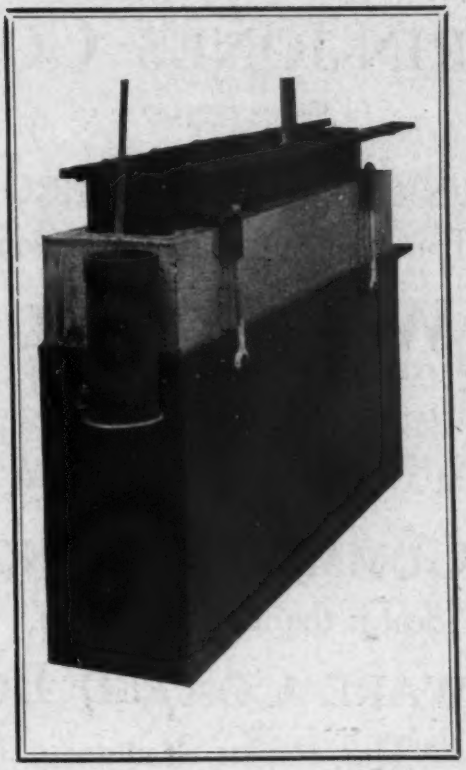
Buck-McRae $2.80

Another Cell $5.00

FLOOR SPACE

B-M 4.9 Sq. ft. per cell

Another Cell—20.5 Sq. ft. per cell



THE JESSUP & MOORE PAPER CO.

Graphite Fabrication

It is an important item to note that the Buck-McRae Cell has no graphite fabrication, while in the average cell the cost is approximately $5.00. This saving, however, represents only a small part of the advantages of the Buck-McRae design over other cells due to the elimination of the troublesome and costly graphite mechanical joints.

The above comparison is not theoretical but the figures as given are the result of several years' operation.

Mechanical Data

Nominal Rating (Standard Cell)	1500 Amperes
Graphite Life	10-12 Months
Weight of Graphite per Cell	268 Lbs.
Graphite Fabrication	None
Cell Dimensions — Length	53.25 inches
Width	13.25 inches
Height	35.5 inches
Active Graphite	3600 square inches
Current Density (Anode)	.42 Amperes square inch

Operating Data

Amperes	1500
Current Efficiency	92%—97%
Voltage per Cell (Average of 100 Cells over 1 year oper.)	3.6
Power Efficiency	58%—64%
Starting Voltage	3.25 Volts
Voltage Rise (during life of Graphite)	1.0 Volt
Maximum Voltage at Graphite Replacement	4.2 Volts
Effluent Volume—New Cell	30 Liters
Renewal of Diaphragm	15 Liters
Life of Diaphragm	6 mo. to 8 mo.
Production per Cell Day (Based on 92% Current Efficiency)	96.1 lb. Chlorine 108.5 lb. NaOH
Kilo-Watt Hours per Pound of Chlorine	1.34 K.W.H.

This data is based on the Standard 1500 Ampere Cell. Cells are also manufactured in ratings: 400 Amperes, 800 Amperes, 1200 Amperes.

The unique and compact design of the Buck-McRae Cell makes possible an unqualified statement that there is no Electrolytic Cell on the market today which will approach the Chlorine and Caustic Soda production per kilo-watt hour that is possible with this Cell nor which will compare with it in general operating advantages and maintenance cost. It has received the highest compliments from Electrolytic Engineers both in this country and abroad and is now submitted to the trade in general for investigation and inquiries.

McLAURIN-JONES COMPANY

Manufacturers of

Guaranteed Flat Gummed Papers

"The Standard of Comparison"

WAREGOLD

Cover and Label Papers

"Bright as the gleam of an August sun"

IDEAL GUMMED SEALING TAPE

"Ideal is the tape that sticks"

ARTWARE COATED BOOK

"The Paper Beautiful"

GLASSAD

The New Window Poster Paper

OTHER ATTRACTIVE LINES:

Dependon Stay Paper
Gummed Cloth **Veneer Tape**
Re-ly-on Proofing Paper
Waregold Greeting Card—Post Card—Blotting

Box Coverings **Plated Papers**
Lithographic and Printing Papers
Envelope Liners
Cloth Lined Papers

MAIN OFFICE

Brookfield, Mass.

Mills:
Brookfield, Mass.
Ware, Mass.

Branch Offices:
New York—150 Nassau St.
Chicago—1858-9 Transportation Bldg.

Carried by Distributors throughout United States.

Congratulations

to the

AMERICAN PAPER AND PULP ASSOCIATION

Fiftieth Anniversary

1878 — 1927

Six Distinct Divisions

SULPHITE BONDS AND LEDGERS

"K.V.P." (watermarked) Bond, Glendale Bond, Flivver Bond. Each in six colors and white. K.V.P. Ledger — Buff and White.

GENUINE VEGETABLE PARCHMENT

The best protection for marketing Dairy Products, Meats, etc., all moist and oily foods. Rolls or flat sizes to meet all needs. Printed or Plain.

WAXED PAPERS—Printed or Plain

Carton and Bread Wrappers—the "Stay Put" kind. Automatic wrapping and lining machine rolls.

RULED PAPER DIVISION

K.V.P. Fine Writings and Bonds made up into special and all standard ruled forms for school and commercial uses.

DEVELOPMENT DIVISION

Eternally alert for new papers for special purposes.

No-Ox-Id (Rust Proof Paper)

Whalehide (An indissoluble sheet of wrapping paper).

GOOD HOUSEKEEPING PAPERS

Shelf and Lining Rolls, 100 ft.—14, 20 and 28 in. wide

Household Parchment—Rolls, 100 ft. long, 12 in. wide

Heavy Waxed Paper—Rolls, 150 ft. long, 12 in. wide.

Waxed and Papricloth Specialties.

Klothwhite and Drug Bond for Druggist and Stationer.

KALAMAZOO VEGETABLE PARCHMENT CO.

KALAMAZOO, MICH.

Clifton Paper Mills

Passaic, N. J.

BENJ. I. WARD
President

FRED'K. M. BUTLER
Secretary & Treasurer

H. N. DAVIDSON
Manager

Manufacturers of

Test Board and Solid Container Box Board

1878 1977

The Chillicothe Paper Co.

MANUFACTURERS

Chillicothe, Ohio.

LOGAN OFFSET

LOGAN E F BOOK	LOGAN S & SC BOOK
LOGAN EGGSHELL BOOK	ADENA E F BOOK
ADENA S & SC BOOK	ADENA EGGSHELL BOOK

E F MUSIC

LOGAN BOND	ADENA BOND

Mill and General Sales Office — Chillicothe. Ohio

New York Office — 41 Park Row

1878 1978

GEORGE R. WALLACE, *Pres. & Treas.*

GEORGE R. WALLACE, JR., *V. P. & Mill Mgr.* FREDERICK WALLACE, *Asst. Treas.*

Fitchburg Paper Company

FITCHBURG, MASS.

Founded 1861

Manufacturers of

Fitchburg Finish Printing Papers

Of Several Grades, Especially Adapted

To

Web, Flat Bed, and Rotogravure Printing

Also Of

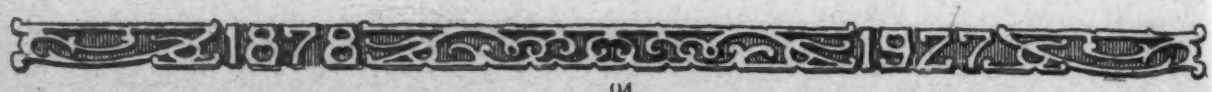
Specialties

For

Coating Mills and Wall Paper Manufacturers

Quality Papers for Particular Purposes

Yearly Capacity — 35000 Tons



Kimberly-Clark Company

ESTABLISHED 1872

Neenah, Wis.

Manufacturers of

ROTOPLATE

Reg. U. S. Pat. Off.

the perfect paper for rotogravure printing

Also

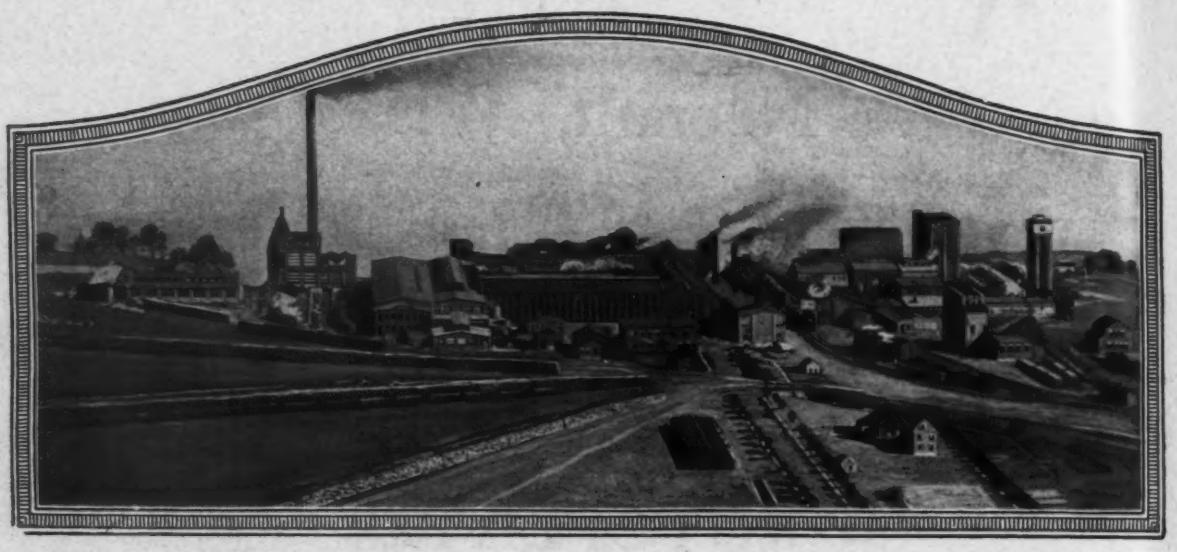
Superior Book Papers

PRIMOPLATE — HYLOPLATE — FEATHERPLATE — SERVOPLATE
PRIMO ENGLISH FINISH—HYLO ENGLISH FINISH — FEATHER ENGLISH FINISH—SERVO ENGLISH FINISH

Great Opacity—Smooth Finish

NEW YORK: 51 Chambers St. LOS ANGELES: 716 Sun Finance Bldg. CHICAGO: 208 South La Salle St.

1878 1978



Hammermill Paper Company

extends to

The American Paper and Pulp Association

heartiest congratulations

on its

Fiftieth Anniversary

1878 1971

PURE GOLD

There's Just One Standard of Money Value and that's Pure Gold

THERE'S down-right keen satisfaction in knowing that there is something that this funny old world of ours uses these days as a standard. It is gold—pure gold.

Years ago, when the miners blew into a boom town the scales were on the bar so that the pure golden dust might be weighed and used as purchase money. Today we read of tremendous shipments of gold bullion crossing the ocean to pay a nation's debt or being transferred from an old sub-treasury to a new one. And then the reporters grow eloquent over the elaborate guard system and the sawed off shot-gun army that protected this pure gold.

Yellowbacks and greenbacks are but tokens. Counterfeiters have produced duplicates so good that they made it difficult to tell the difference between the spurious and the genuine. Storekeepers have been fooled and banks bilked.

Even diamond imitations are made so cleverly of paste that experts are puzzled at times. Rubies and emeralds and sapphires are easily counterfeited.

But one is never fooled by pure gold. There is no alternate.

There is no substitute for a standard—whether it be of principles, practices or papers. There never has been and never will be a substitute for Byron Weston's Linen Record made by

Byron Weston Company

Mills at Dalton, Massachusetts, U. S. A.

LEADERS IN LEDGER PAPERS

1878 1927

Daily Capacity 110,000 lbs.

Mills at
East Walpole, Mass., West Groton, Mass.

HOLLINGSWORTH & VOSE CO.

Manufacturers of

Rope and Jute Manila Papers

FOURD. & CYL. SAND
ELECTRIC INSULATING PAPER
ROPE AND JUTE TAG STOCK
STENCIL PAPER
MUSIC ROLL PAPER
SATURATING PAPERS
DUPLEX PAPERS
ROPE and JUTE COATING STOCK
PATTERN PAPER
RED ROPE PAPER

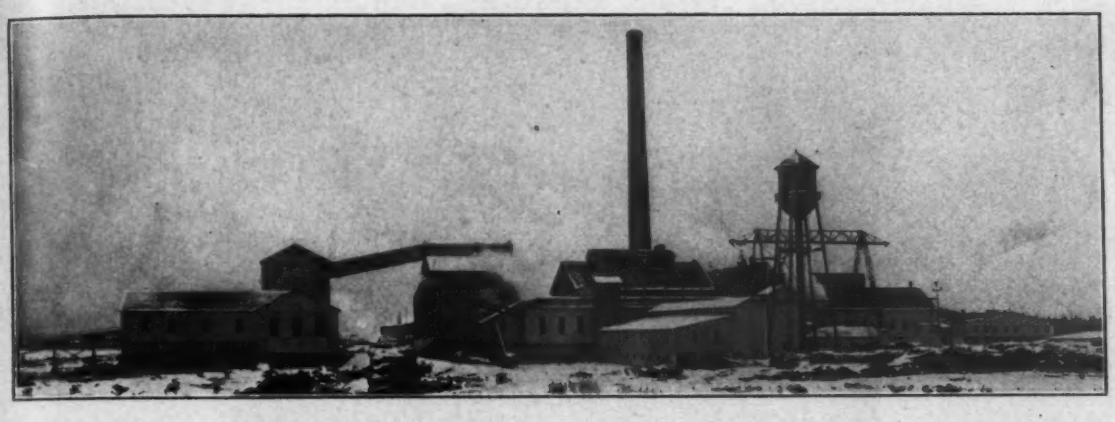
Manufacturers of **IronTag** Tag Stock of Quality

We are prepared to make Special Papers for special uses and would be pleased to work out your paper problems through our Department of Engineering Methods.

Offices: 333 Washington Street Boston, Mass.

U. S. Patent granted in 1843 to J. M. & L. Hollingsworth for process of making paper from manila fibre.

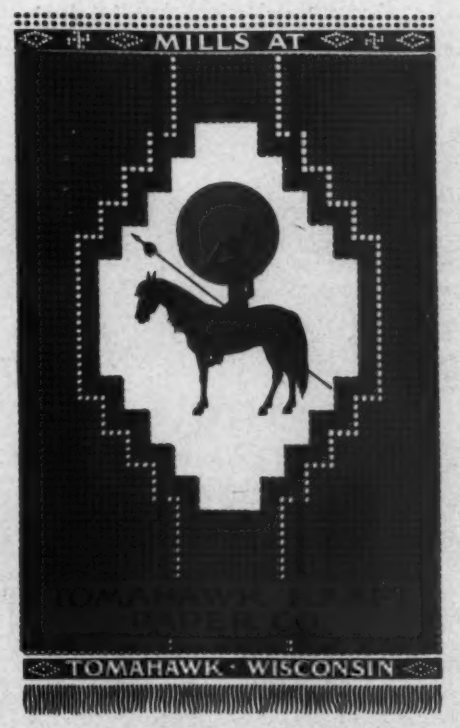
1878 1977



TOMAHAWK KRAFT PAPER COMPANY

A. L. KREUTZER, PRESIDENT

John F. Ross, Vice Pres.
Willits Pollock, Director
F. P. Stone, Director
H. M. Thompson, Director
C. C. Yawkey, Director



S. B. Bugge, V. P. & Gen. Mgr.
D. C. Everest, Secretary-Treasurer
Geo. E. Crandell, Director
W. H. Knoedler, Asst. Secy-Treas.
E. V. Fox, Manager of Sales

No. 1 KRAFT FIBRES

WRAPPING, BLEACHED AND SEMI-BLEACHED SULPHATE KRAFT SPECIALTIES

1878 1978

1859

Original Mill
1869
600 tons

Business founded
1859

F. L. Stevens, Pres.
F. N. Stevens, V. P.
F. L. Scott, V. P., Sales Mgr.
H. B. Thompson, Treas.
B. W. Sugden, Secy.

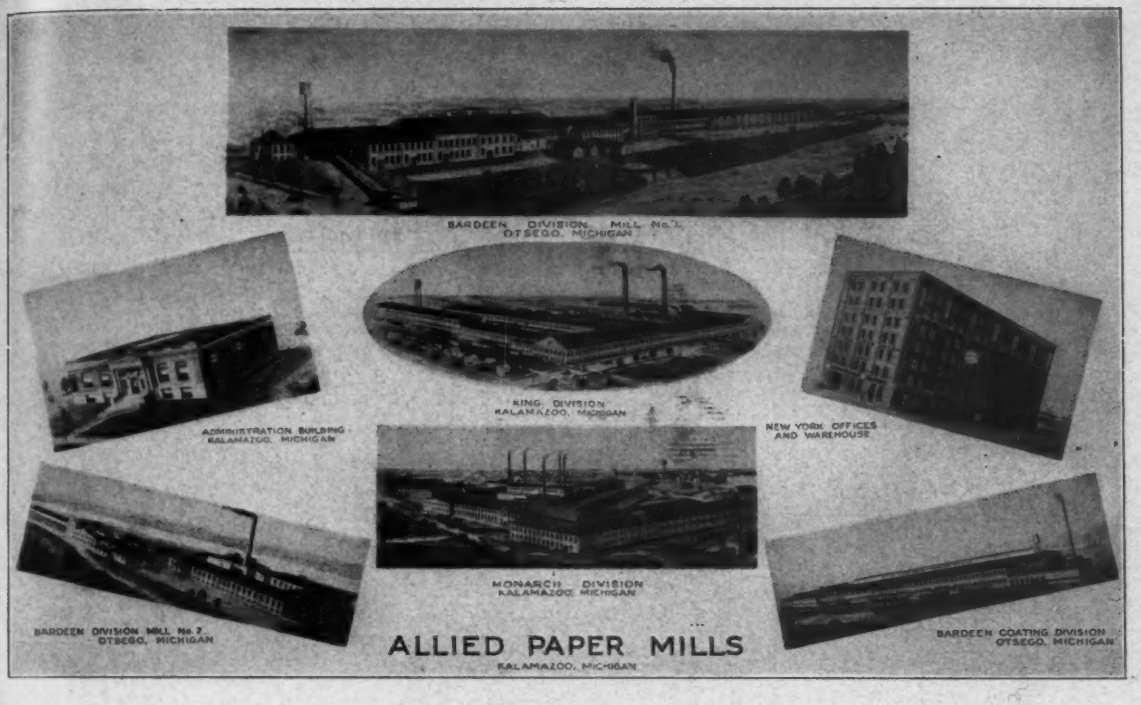
STEVENS & THOMPSON PAPER COMPANY
NORTH HOOSICK, N. Y.

Production — 24,000 tons per year

Tissue, Toilet, Towel, Napkins—Tag Board, Colored Coating Base & Specialties
Colored Wall Paper Specialties
Paper Food Trays

GREENWICH PLANT

1878 1978



Where
DEPENDABLE PAPERS
Are Made

ALLIED PAPER MILLS
DEPENDABLE
PAPERS
KALAMAZOO, MICH.

Specify and Use

Dependable Papers

Made by

Allied Paper Mills

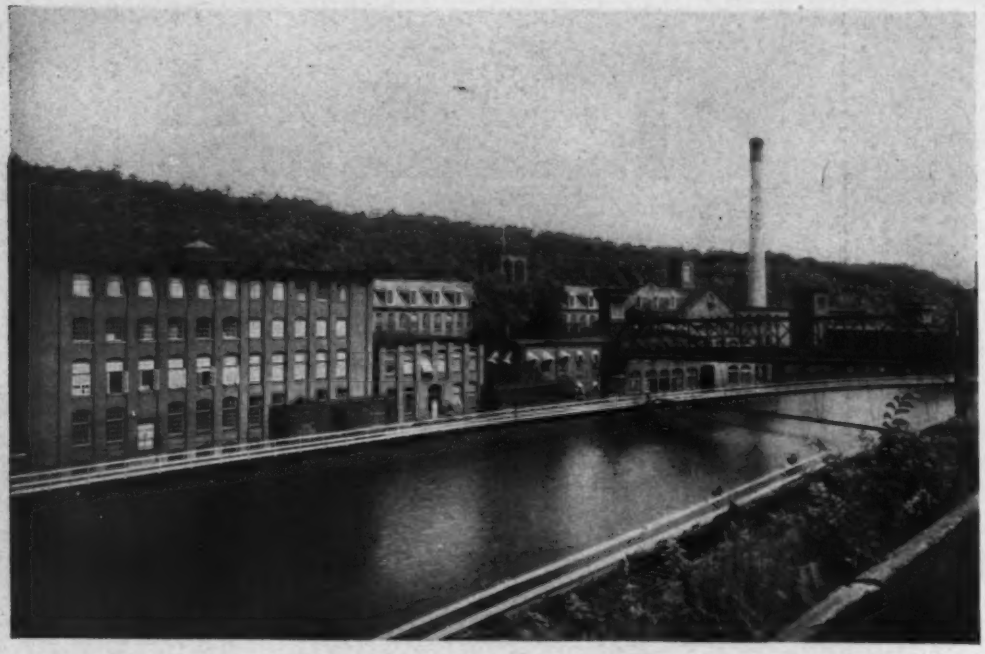
Kalamazoo, Michigan

1878 1971

KEITH PAPER COMPANY

Turners Falls, Massachusetts

1871 - 1927



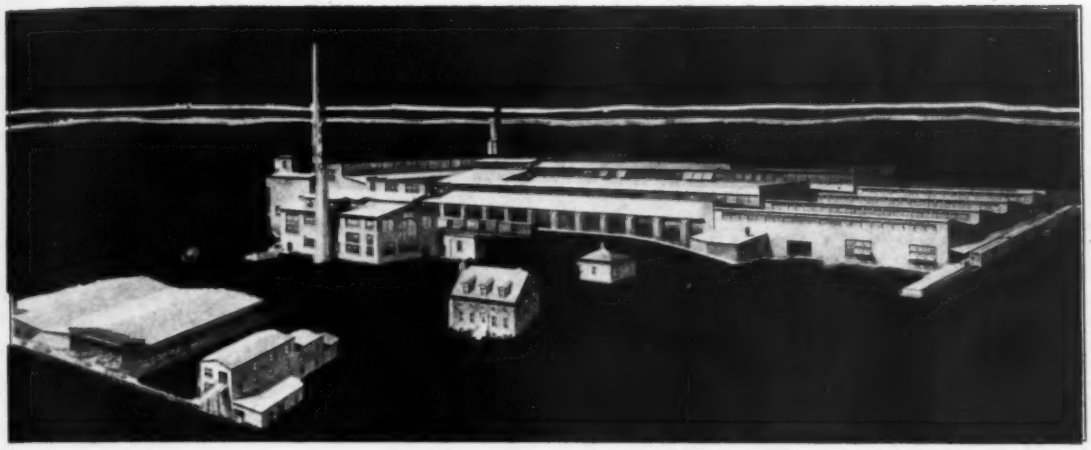
For over 50 years
Manufacturers of the well known

"KEITH QUALITY"

BONDS ∴ LINENS ∴ LEDGERS ∴ WEDDINGS

1878 1927

1897 1927



Plant of the

SCHMIDT & AULT PAPER CO.

YORK, PA.

1798

Philip J. King

erected on this site a mill manufacturing high grade hand made note and letter paper.

1897

Codorus Paper Mills

Present owners came into possession of the property operating one 48″ cylinder machine.

1927

Now operating with

1 — 90″ cylinder machine
1 — 48″ cylinder machine
1 — 90″ Fourdrinier machine
1 — 72″ Fourdrinier machine

BOSTON
I. B. Ogden
201 Devonshire Street
Main 8474

NEW YORK
M. L. Macauley Co.
30 E. 42nd St.
Murray Hill 2955

CHICAGO
E. C. Burger
Conway Bldg.
Franklin 1697

1878 1927

Printed by PRESS PRINTING CO.
East Stroudsburg, Pa.